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14CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017

Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each module.

Module-1

- 1 a. Define ion selective electrode. Explain the principle and construction of glass electrode. (05 Marks)
- b. Describe the construction and working of Ni-metal hydride battery. Write its application. (05 Marks)
- c. Define concentration cell. The spontaneous cell $\text{Sn}|\text{Sn}^{2+} (0.024 \text{ M})||\text{Sn}^{2+} (0.064)|\text{Sn}$ at 25°C . Calculate the emf of the cell and cell reactions. (05 Marks)
- d. Explain the following battery characteristics:
 - i) Voltage,
 - ii) Energy efficiency,
 - iii) Cycle life (05 Marks)
- 2 a. Derive Nernst's equation for single electrode potential. (05 Marks)
- b. Define fuel cell. Explain the construction and working of Lithium MnO_2 cell. Write its application. (05 Marks)
- c. What are secondary reference electrodes? Explain the construction and working of Calomel Electrode. (05 Marks)
- d. Explain the construction and working of Methanol Oxygen fuel cell. (05 Marks)

Module-2

- 3 a. Explain the following corrosion types:
 - i) Differential metal corrosion, (05 Marks)
 - ii) Differential aeration corrosion. (05 Marks)
- b. Define electroplating. Write technological importance of metal finishing. (05 Marks)
- c. What is anodic metal coating? Explain the process of Galvanizing. (05 Marks)
- d. Describe the electroplating of chromium. (05 Marks)
- 4 a. Explain the electrochemical theory of rusting of iron. (05 Marks)
- b. Discuss the electroless plating of copper with reactions. (05 Marks)
- c. Explain the factors affecting the rate of corrosion:
 - i) Nature of corrosion product
 - ii) pH (05 Marks)
- d. Discuss the following principles of metal finishing:
 - i) Decomposition potential
 - ii) Over voltage. (05 Marks)

Module-3

- 5 a. Define calorific value of a fuel. Explain the calorific value of solid fuel by determination by bomb calorimeter. (05 Marks)
- b. Define photovoltaic cell. Explain construction and working of PV cell. (05 Marks)
- c. Explain the synthesis of petrol by Fischer-Tropsch process. (05 Marks)
- d. Explain the purification of Silicon by zone refining process. (05 Marks)

- 6 a. Define cracking. Explain the process of fluidized bed catalytic process cracking with neat diagram. (05 Marks)
b. Discuss the production of solar grade Silicon by Union Carbide process. (05 Marks)
c. Write a short note on power alcohol and knocking in petrol engine. (05 Marks)
d. Define doping. Write two physical and two chemical properties of silicon. (05 Marks)

Module-4

- 7 a. Define polymer. Explain the addition and condensations polymerization with examples. (05 Marks)
b. Discuss the synthesis and application of Silicon rubber and polyurethane. (05 Marks)
c. Explain any two structures and property of relations of polymers. (05 Marks)
d. Write the mechanism of conduction in polyaniline. (05 Marks)
- 8 a. Explain free radical mechanism of addition polymerization by taking Vinyl Chloride as an example. (05 Marks)
b. Explain the synthesis and applications of (i) plexi-glass, (ii) Teflon. (05 Marks)
c. Discuss the factors influencing the T_g :
i) Flexibility
ii) Branching and cross linking. (05 Marks)
d. What are conducting polymers? Write synthesis properties of Carbon fibres. (05 Marks)

Module-5

- 9 a. How scales and sludges are formed in boilers and write its disadvantages. (05 Marks)
b. What are nanoscale materials? Explain synthesis of nanomaterials by chemical vapour condensation method. (05 Marks)
c. What is desalination of water? Explain the desalination of sea water by reverse osmosis. (05 Marks)
d. Write a note on size dependent properties of nanomaterials. (05 Marks)
- 10 a. Write a note on secondary sewage treatment method. (05 Marks)
b. Write an account on carbon nanotubes. (05 Marks)
c. Define fullerenes. Explain hydrothermal synthesis of nanomaterials. (05 Marks)
d. 25 cm^3 of an effluent sample requires for oxidation of 8 cm^3 of $0.001 \text{ M K}_2\text{Cr}_2\text{O}_7$. Calculate the COD of the effluent sample. (05 Marks)

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CBCS Scheme

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15CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Describe the construction and working of Li-MnO₂ battery. (05 Marks)
b. Define battery. Explain the following battery characteristics:
(i) Electricity storage density.
(ii) Energy efficiency.
(iii) Cycle life.
(iv) Shelf life. (05 Marks)
c. Define reference electrode. Explain the construction and working of Calomel electrode. (06 Marks)

OR

- 2 a. A concentration cell was constructed by immersing two silver electrodes in 0.02 M and 2 M AgNO₃ solution. Write the cell representation, cell reactions and calculate the EMF of the cell at 25°C. (05 Marks)
b. Derive Nernst equation for single electrode potential. (05 Marks)
c. Explain the construction and working of methanol oxygen fuel cell. Mention its application. (06 Marks)

Module-2

- 3 a. What is cathodic protection? Explain how a metal article is protected by sacrificial anodic method. (05 Marks)
b. Explain the following factors affecting the rate of corrosion:
(i) Nature of the metal.
(ii) Ratio of anodic to cathodic areas.
(iii) pH. (05 Marks)
c. Explain electroless plating of copper with relevant reaction. (06 Marks)

OR

- 4 a. What is metal finishing? Give the technological importance of metal finishing. (05 Marks)
b. Explain the influence of the following factors on the nature of electrodeposit:
(i) pH.
(ii) Temperature.
(iii) Concentration of the metal ion. (05 Marks)
c. Explain stress and differential metal corrosion with example. (06 Marks)

Module-3

- 5 a. Define cracking. Describe fluidized bed catalytic cracking. (05 Marks)
b. What is biodiesel? Explain the synthesis and advantages of biodiesel. (05 Marks)
c. Explain the production of solar grade silicon by union-carbide process. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Define photo voltaic cell. Explain the construction and working of photo voltaic cell. (06 Marks)
- b. Explain the purification of silicon by zone refining. (04 Marks)
- c. A 0.6 g of coal sample (carbon 90%, H₂ 3% and ash 7%) was subjected to combustion in a bomb calorimeter. Mass of water taken in the calorimeter was 2000 g and the water equivalent of calorimeter was 400 g. The rise in temperature was 3°C. Calculate the gross and net calorific value of the sample. Given, specific heat of water is 4.187 KJ/kg/°C and latent heat of steam is 2454 KJ/kg. (06 Marks)

Module-4

- 7 a. Explain the free radical mechanism for addition polymerization by taking vinyl chloride as an example. (06 Marks)
- b. Explain the synthesis, properties and applications of epoxy resin. (04 Marks)
- c. What is glass transition temperature? Explain the following factors affecting glass transition temperature.
(i) Chain flexibility and
(ii) Intermolecular forces. (06 Marks)

OR

- 8 a. Explain structure – property relationship of polymers with respect to,
(i) Crystallinity (ii) Tensile strength (05 Marks)
- b. What is polymerization? Explain addition and condensation polymerization with example. (05 Marks)
- c. What are polymer composite? Explain the synthesis, properties and application of Kevlar fibre. (06 Marks)

Module-5

- 9 a. Write a note on fullerenes. Mention its application. (05 Marks)
- b. Discuss the synthesis of nanomaterials by gas condensation method and chemical vapour condensation processes. (05 Marks)
- c. Discuss the experimental determination of Dissolved Oxygen (DO) of waste water. Mention the reactions involved in it. (06 Marks)

OR

- 10 a. What is desalination? Discuss the desalination of sea water by ion exchange process. (05 Marks)
- b. What is boiler feed water? Explain the scale and sludge formation in boilers. (05 Marks)
- c. Explain any three size dependent properties of nanomaterials. (06 Marks)

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10CCPI3/23

First/Second Semester B.E. Degree Examination, June/July 2016
Computer Concepts and 'C' Programming

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing at least two from each part.
2. Use of steam tables is not permitted.

PART - A

- 1 a. Choose the correct answers for the following : (04 Marks)
- Which of the following is not a type of computer based on individual usage? (04 Marks)
 - Desktop computer
 - Workstation
 - Digital computer
 - Smart phone
 - Note book computer is also called as _____
 - PDA's
 - Laptops
 - Smart phones
 - Tablet computer
 - Display system in table computer can be rotated by _____
 - 60°
 - 120°
 - 90°
 - 180°
 - One Terabyte = _____
 - 1024 GB
 - 1024 MB
 - 1024 KB
 - 1024 bytes
- b. Explain briefly the basic structure of a computer along with a block diagram. (06 Marks)
- c. Explain the different types of audiovisual input devices. (10 Marks)
- 2 a. Choose the correct answers for the following : (04 Marks)
- The capacity of a floppy disk is _____
 - 2.44 MB
 - 1.44 MB
 - 2.48 MB
 - 2.48 MB
 - Which of the following is an example of system software?
 - MS - WORD
 - Microsoft excel
 - Text editor
 - Payroll
 - In star topology the central computer is called
 - Host
 - Source
 - Hub
 - None
 - 1 byte = ____ Nibbles.
 - 4
 - 2
 - 8
 - 1
- b. Explain how the data is organized in magnetic disk. (04 Marks)
- c. What is Operating system? Explain the types of operating system. (08 Marks)
- d. Mention the need for networking. (04 Marks)
- 3 a. Choose the correct answers for the following : (04 Marks)
- Which of the following command is used to save the program?
 - F3
 - Cntrl + V
 - F2
 - Cntrl
 - Which of the following is a newline character?
 - \t
 - \f
 - \b
 - \n
 - _____ format specifier converts the data into floating point value.
 - %e
 - %o
 - %d
 - %u
 - Which input function accept the string as input from the keyboard?
 - getchar ()
 - gets ()
 - getch ()
 - getche ()
- b. Explain the basic data types available in C language. (08 Marks)
- c. Explain the formatted Input and Output function with example. (08 Marks)
- 4 a. Choose the correct answers for the following : (04 Marks)
- Which of the following operator is R → L associativity.
 - <
 - +
 - ^
 - =

1 of 3

- ii) What is the output of the following statement `printf("%d\n", 12,345, 678)?`
 A) 12 B) 12 C) 12,345 D) 12,345, 678
- iii) An expression with only one operand but not any operator is called _____
 A) Primary B) Ternary C) unary D) Binary
- iv) If $i = 3$, $j = 4$, what is the value of $j + 1 / i - 1$.
 A) 2 B) 1 C) 4 D) 3
- b. Simplify the expression $a + = b * = C - = 5$, where $a = 1$, $b = 3$, $c = 7$. (04 Marks)
- c. Write a C program to find the area of a triangle given the 3 sides. (06 Marks)
- d. Explain the increment and decrement operator with program. (06 Marks)

PART - B

- 5 a. Choose the correct answers for the following : (04 Marks)
- i) Which of the following header file is used if we use `floor ()` function :
 A) `stdio.h` B) `conio.h` C) `math.h` D) `stdlib.h`
- ii) Which element of user defined function is not terminated by semicolon (;)
 A) function prototype B) function definition
 C) function call D) function declaration
- iii) Pass by value is also called as _____
 A) call by value B) call by reference
 C) function call D) function declaration
- iv) _____ type of variable is accessible through out the program
 A) local variable B) global variable
 C) static variable D) register variable
- b. Explain briefly the different methods of passing parameter. (10 Marks)
- c. Write a C program to compute cube of a given number using functions. (06 Marks)
- 6 a. Choose the correct answers for the following : (04 Marks)
- i) The complement of `<` is _____
 A) `> =` B) `< =` C) `>` D) `= =`
- ii) What is the output of the following program segment
- ```
#include<stdio.h>
Void main ()
{
 int i = 10 ;
 while (0)
 {
 Printf ("%d", i);
 }
}
```
- A) 0                      B) 10  
 C) No output                      D) 0 is displayed  $\infty$  times
- iii) Which of the following is valid :  
 A) Case 4 :                      B) Case `"4"` :                      C) Case `i + 2` :                      D) Case `'choice'` :
- iv) Which of the following loop is used when we do not know exactly how many times a set of statements have to be repeatedly executed.  
 A) for                      B) while                      C) do while                      D) switch
- b. Write a C program to find the roots of quadratic equation.                      (08 Marks)
- c. Differentiate between while and do while loop with example.                      (08 Marks)

- 7 a. Choose the correct answers for the following : (04 Marks)
- Array always starts from index \_\_\_\_\_  
A) 1                      B) -1                      C) 0                      D) 2
  - Linear search is also called as \_\_\_\_\_  
A) Binary search                      B) Sequential search  
C) Traversal                      D) Sort
  - The string "0" occupies \_\_\_\_\_ bytes  
A) 2 byte                      B) 1 byte                      C) 4 byte                      D) 8 byte
  - In a variable length string, string always ends with a delimiter  
A) POS                      B) POS - 1                      C) NULL                      D) NULL + 1
- b. Explain briefly the declaration and initialization of one dimensional array. (08 Marks)
- c. Write a C program to count vowels and constants in a given string. (08 Marks)
- 8 a. Choose the correct answers for the following : (04 Marks)
- SET 1 stands for  
A) Search for extra terrestrial intelligence  
B) Search for extra topology intelligence  
C) Search for extraordinary terrestrial intelligence  
D) Search for extra typical intelligence
  - The concept of sharing of memory by various threads in program is called \_\_\_\_\_  
A) sharing memory                      B) shared memory  
C) sequential memory                      D) sorting memory
  - Which of the following directive is not used during synchronization of tasks  
A) barrier directive                      B) include directive  
C) ordered directive                      D) flush directive
  - Which of the function returns non zero value if dynamic adjustment is enable  
A) void Omp – get – dynamic (int dynamic \_ thread)  
B) int Omp – get – dynamic ( )  
C) void Omp – get – nested (int nested)  
D) int Omp – get – nested ( )
- b. What is Thread? Explain the logical memory model of a thread. (10 Marks)
- c. What are the various motivating factors of Parallel programs? (06 Marks)

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14PCD13/23

**First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Programming in 'C' and Data Structures**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting ONE full question from each module.**

**Module-1**

- 1 a. List all the restrictions on the variable names. (06 Marks)  
b. Explain the block structure of a 'C' program. (08 Marks)  
c. What are the basic data types available in 'C'? Write the significance of each data type. (06 Marks)
- 2 a. What is an assignment statement? Give the general form of an assignment statement. (05 Marks)  
b. Explain with example, the various constants available in 'C' program. (05 Marks)  
c. List and explain any five operators used in 'C' programming language. (10 Marks)

**Module-2**

- 3 a. Explain with example, the meaning of statement and block in a 'C' program. (05 Marks)  
b. Explain with a syntax, the different loops used in 'C' program. (09 Marks)  
c. Write a program in 'C' to find the sum of 'n' natural number without using any loops. (06 Marks)
- 4 a. Explain with example, the need of 'break' statement in a 'C' program. (05 Marks)  
b. Write a 'C' program to demonstrate the use of unconditional goto statement. (06 Marks)  
c. Explain with syntax, if, if-else and nested if-else statements in 'C' program. (09 Marks)

**Module-3**

- 5 a. What is the purpose of an array? Explain how two dimensional arrays is declared and initialized. (06 Marks)  
b. Explain with example :  
i) Character string  
ii) String literal. (06 Marks)  
c. Write a program in 'C' using functions to swap two numbers. (08 Marks)
- 6 a. Explain with syntax and example, the different types of string manipulation functions. (10 Marks)  
b. Explain with example, the general form of puts and gets function. (04 Marks)  
c. What are the three possibilities of defining a user defined functions in 'C'? (06 Marks)

**Module-4**

- 7 a. What is a structure data type? Give the general form of a structure declaration. (05 Marks)  
b. Explain the syntax of fprintf and fscanf functions in 'C'. (05 Marks)  
c. Using the structure data type, write a program in 'C' to read a student record from the keyboard and store it in a file called student.dot. (10 Marks)

- 8 a. Explain the differences between arrays and structures. (05 Marks)  
b. What is a file? Explain fopen( ) and fclose( ) functions in 'C' language. (06 Marks)  
c. Write a program in 'C' using structure to read USN, name and marks in 3 subjects for each student and store it in a file called studmarks.dat. (09 Marks)

**Module-5**

- 9 a. Write a 'C' program to define macros for logical operators. (08 Marks)  
b. Explain the following :  
i) preprocessor directive  
ii) malloc( ) function  
iii) # include directive. (06 Marks)  
c. Explain the need of dynamic memory allocation. (06 Marks)
- 10 a. Explain with example # define directive. (04 Marks)  
b. What is a stack? What are the operations we can carry out on a stack? (08 Marks)  
c. Write a program in 'C' to create a simple linked list. (08 Marks)

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# CBCS Scheme

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15PCD13/23

## First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Define an Algorithm. Write an algorithm to find the area and perimeter of a rectangle. (06 Marks)
- b. Write a General structure of C. Explain with an example. (06 Marks)
- c. Convert the following mathematical expression into C equivalent:
- i)  $\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
- ii)  $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$  (04 Marks)

OR

- 2 a. Explain different types of input output functions in C with syntax and examples. (06 Marks)
- b. Explain the following operators :
- i) Unary
- ii) Bitwise
- iii) Conditional. (06 Marks)
- c. Draw the flowchart and write a C program to compute simple interest. (04 Marks)

### Module-2

- 3 a. List all the conditional control statements used in C. Explain any two with syntax and example. (06 Marks)
- b. Write a C program that reads from the user an arithmetic operator and two operands perform the corresponding arithmetic operation on the operands using switch statement. (06 Marks)
- c. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not. (04 Marks)

OR

- 4 a. What are unconditional control statements? Explain any two with example. (06 Marks)
- b. List the types of looping statements in C. Explain any two with syntax and example. (06 Marks)
- c. Develop a C program to read a year as an input and find whether it is Leap year or not. (04 Marks)

### Module-3

- 5 a. What is Array? Explain the declaration and initialization of one dimensional and two dimensional Array with example. (06 Marks)
- b. Explain any four string manipulation library function with example. (04 Marks)
- c. Write a C program to implement string copy operation STRCOPY (str1, str2) that copies a string str1 to another string str2 without using Library function. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants. (06 Marks)  
b. What is a Function? Explain the type of functions based on parameters. (06 Marks)  
c. What is Recursion? Write a C program to compute polynomial co-efficient  ${}^n C_r$  using Recursion. (04 Marks)

Module-4

- 7 a. What is structure? Explain the C Syntax of structure declaration with example. (04 Marks)  
b. What is a FILE? Explain any five file manipulation functions with example. (06 Marks)  
c. What are actual and formal parameters? Explain various storage classes available in C. (06 Marks)

OR

- 8 a. Explain array of structure and structure within a structure with an example. (06 Marks)  
b. Write a C program to maintain a record of 'n' students details using an array of structures with four fields (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student given the student name as input. (06 Marks)  
c. Explain various modes of FILE with example. (04 Marks)

Module-5

- 9 a. What is a pointer? Explain how the pointer variable is declared and initialized. (04 Marks)  
b. What is dynamic memory allocation? Explain different dynamic memory allocation functions in C. (06 Marks)  
c. Write a C program using pointers to compute the Sum, Mean and Standard deviation of all elements stored in an array of 'n' real numbers. (06 Marks)

OR

- 10 a. Explain the Array of pointers with example. (04 Marks)  
b. Explain any two pre-processor directives in C. (04 Marks)  
c. What is Stack? Explain operations on Stack. (04 Marks)  
d. What is a Queue? Explain its applications. (04 Marks)

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# CBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017

## Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Define the following diode parameters : (05 Marks)
- Knee voltage
  - Maximum forward current
  - Peak inverse voltage
  - Reverse breakdown voltage
  - Maximum power rating. (06 Marks)
- b. With neat circuit diagram and waveform explain the working of Full wave Bridge Rectifier.
- c. Draw common emitter circuit. Sketch input and output characteristics. Also explain operating regions by indicating them on characteristic curve. (05 Marks)

OR

- 2 a. Write a note on voltage regulator circuit. (05 Marks)
- b. Derive the relationship between  $\alpha$  and  $\beta$ . Also calculate the  $\alpha$  value and  $\beta$  value of a transistor if  $I_B = 100\mu A$  and  $I_C = 2mA$ . (04 Marks)
- c. With a neat diagram, explain the output characteristics of a transistor in common base configuration. (07 Marks)

### Module-2

- 3 a. What is DC load line? Explain with neat circuit the operation of voltage divider bias circuit. (05 Marks)
- b. What is op-amp? List the characteristics of an ideal op-amp. (06 Marks)
- c. For the circuit shown in Fig Q3(c). compute
- Three transistor currents
  - Voltage drop across  $R_C$  and  $R_B$ . (05 Marks)

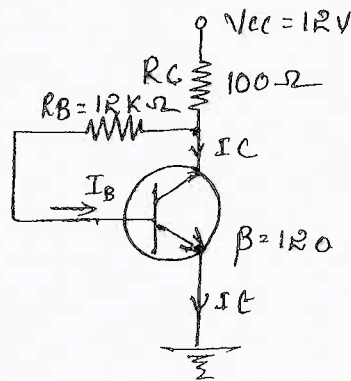


Fig Q3(b)



OR

- 4 a. Explain how op-amp can be used as  
 i) An integrator ii) Differentiator iii) Voltage follower. (06 Marks)  
 b. With neat circuit diagram, explain base biased method with necessary equations. (05 Marks)  
 c. Find the output of the following op-amp circuit. (05 Marks)

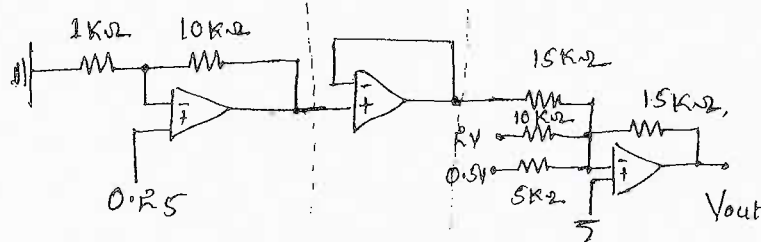


Fig Q4(c)

Module-3

- 5 a. Convert  $(1101101)_2 = ( )_{10}$  and  $(96)_{10} = ( )_2$ . (04 Marks)  
 b. Convert  $(FA876)_{16} = ( )_8$  and  $(237)_8 = ( )_{16}$ . (04 Marks)  
 c. Design Full adder circuit. (08 Marks)

OR

- 6 a. State and prove De Morgan's theorem. (05 Marks)  
 b. What are Universal gates? Realize AND, OR Gates using Universal gates. (05 Marks)  
 c. Subtract  $(19)_{10}$  from  $(15)_{10}$  using 1s and 2s compliment methods. (06 Marks)

Module-4

- 7 a. Write a note on NOR gate latch. (05 Marks)  
 b. Explain the working of clocked RS flip flop using NAND gates. (06 Marks)  
 c. Define microcontrollers. Write their important applications. (05 Marks)

OR

- 8 a. Explain the architecture of 8051 micro controller. (08 Marks)  
 b. Mention the difference between latch and Flip flop. (02 Marks)  
 c. Write a note on interfacing of 8051 microcontroller with stepper motor. (06 Marks)

Module-5

- 9 a. Explain the block diagram of communication system. (05 Marks)  
 b. Define Amplitude modulation. Derive mathematical expression for the same. Draw waveforms. (06 Marks)  
 c. Explain the construction and the principle of operation of LVDT. (05 Marks)

OR

- 10 a. List the differences between Amplitude modulation and frequency modulation. (05 Marks)  
 b. Explain frequency modulation with neat waveforms. (05 Marks)  
 c. A carrier of 10V peak and frequency 100KHz is amplitude modulated by a sine wave of 4V peak and frequency 1000Hz. Determine the modulation index for the modulated wave and draw the amplitude spectrum. (06 Marks)

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**First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017**  
**Environmental Studies**  
**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 50

**INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the fifty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

- 
1. The study of interactions between living organisms and environment is called as,  
a) Ecosystem      b) Ecology      c) Phytogeography      d) Phytosociology
  2. The short term properties of the atmosphere at a given place and time is referred as.  
a) Climate      b) Microclimate      c) Season      d) Weather
  3. Common energy source in Indian villages is,  
a) Electricity      b) Coal      c) Sun      d) Wood and animal dung.
  4. Fossil fuels and metallic minerals are,  
a) Renewable resources      b) In exhaustible resources  
c) Non-renewable resources      d) None of these
  5. Bath power and manure is provided by,  
a) Nuclear plants      b) Thermal plants      c) Biogas plants      d) Hydroelectric plants
  6. Deforestation generally decreases,  
a) Rainfall      b) Soil erosion      c) Drought      d) Global warming
  7. Chipko movement was started to conserve,  
a) Forest      b) Grass land      c) Deserts      d) Soil

8. Terrace farming is practiced in,  
a) Coastal areas                      b) Deserts                      c) Hills                      d) Plains
9. Which ecological pyramid is always straight?  
a) Pyramid of biomass                      b) Pyramid of numbers  
c) Pyramid of energy                      d) Pyramid of numbers and biomass.
10. Increases in fauna and decrease in flora would be harmful due to increase in,  
a) Diseases                      b) CO<sub>2</sub>                      c) O<sub>2</sub>                      d) Radioactive pollution
11. Tropical forest occurs in India in,  
a) Jammu and Kashmir                      b) Rajasthan                      c) Kerala and Assam                      d) No where
12. If all the plants of the earth die suddenly all the animals die due to deficiency of ,  
a) Food                      b) Shade                      c) Oxygen                      d) Shelter
13. In our country the percentage of land under forest is about,  
a) 20%                      b) 19%                      c) 25%                      d) 30%
14. The area reserved for the welfare of wildlife is called,  
a) National park                      b) Botanical garden                      c) Sanctuary                      d) Forest
15. Acid rain is caused by increase in the atmospheric concentration of,  
a) Ozone and dust                      b) SO<sub>2</sub> and NO<sub>2</sub>                      c) SO<sub>3</sub> & CO                      d) CO<sub>2</sub> & CO
16. Gas leaked in Bhopal tragedy was,  
a) Potassium isothiocyanate                      b) Sodium isothiocyanate  
c) Ethyl isocyanate                      d) Methyl isocyanate
17. Ozone layer of upper atmosphere is being destroyed by,  
a) Sulphur dioxide                      b) Photochemical oxidants  
c) Chlorofluorocarbon                      d) Smog
18. Dysentery spread due to,  
a) Food adulteration                      b) Humid weather  
c) Water pollution                      d) Air pollution
19. Maximum deposition of DDT will occur in,  
a) Phytoplankton                      b) Crab  
c) Eel                      d) Sea gull
20. Disease caused by eating fish inhabiting mercury contaminated water is,  
a) Bright's disease                      b) Minimata diseases  
c) Hashimoto disease                      d) Osteosclerosis
21. Fluoride pollution mainly affects,  
a) Kidney                      b) Brain                      c) Heart                      d) Teeth

22. Which of the following is not a greenhouse gas?  
a) Oxygen                      b) CO<sub>2</sub>                      c) Chlorofluorocarbons                      d) Methane
23. Study of trends in human population growth and prediction of future growth is called,  
a) Demography                      b) Biography                      c) Kalography                      d) Psychology
24. The number of babies produced per thousand individuals is called.  
a) Natality                      b) Mortality                      c) Immigration                      d) Emigration
25. A pesticide/insecticide which has reported to cause physical deformities and disease in infants in Karnataka and Kerala state recently is,  
a) Endosulfan                      b) DDT                      c) Amitraz                      d) None of these
26. The highest concentration of people with HIV infection have been recorded from,  
a) USA                      b) India                      c) China                      d) Africa
27. Vasectomy is the method of sterilization in,  
a) Man                      b) Woman                      c) Both Man and Woman                      d) None of these
28. ICDS is a welfare scheme for,  
a) Public                      b) Women                      c) Men                      d) Children
29. The common pollutants present in ponds and pools nearby agricultural fields are,  
a) Dust                      b) Straw                      c) Pollons                      d) Chemical fertilizer & pesticide
30. The non-green plants which obtains food from other plants are called,  
a) Hosts                      b) Parasites                      c) Saprophytes                      d) Insectivorous plants
31. The liquid wastes from bathroom and kitchens are called,  
a) Sullage                      b) Domestic sewage                      c) Storm water                      d) Runoff
32. EIA is abbreviated form for,  
a) Energy impact assessment                      b) Ecological impact assessment  
c) Environmental impact assessment                      d) Emission impact assessment
33. The fossil fuel which cause maximum environmental pollution due to its use in generation of thermal power is,  
a) Coal                      b) Oil                      c) Natural gas                      d) None of these
34. Most stable ecosystem is,  
a) Forest                      b) Desert                      c) Ocean                      d) Mountains
35. What is the pH range of drinking water,  
a) 6 to 9                      b) 6.5 to 8.5                      c) 6 to 8.5                      d) 6.5 to 7.5
36. Biogas is mostly made of,  
a) Hydrogen                      b) Carbon dioxide                      c) ethane                      d) Methane

37. Which of the following is not a natural disaster:  
 a) Cyclone                      b) Nuclear explosion              c) Earthquake              d) Volcane
38. Which state is having highest women illiteracy rate in India?  
 a) Karnataka                      b) Punjab                      c) Rajasthan                      d) Kerala
39. The percentage of water accounted by oceans and seas is.  
 a) 90%                      b) 87%                      c) 97%                      d) 99%
40. Which of the is not a biodegradable pollutant?  
 a) Plastic                      b) Skins of vegetables and fruits              c) Dry leaves                      d) Paper
41. The concept of BOD comprises of \_\_\_\_\_?  
 a) Biochemical oxygen demand                      b) Usually less than C.O.D  
 c) A measure of the organic matter present in waste water              d) All of these
42. Environmental (protection) act was enacted in the year,  
 a) 1986                      b) 1992                      c) 1984                      d) 1974
43. Which of the following devices is most suitable for removal of gaseous pollutant?  
 a) Cyclonic separator                      b) Fabric filter  
 c) Electrostatic precipitator                      d) Wet collector
44. ISO14000 standard deals with,  
 a) Pollution management                      b) Risk management  
 c) Environmental management                      d) None of these
45. Sound becomes hazardous when noise pollution at \_\_\_\_\_ decibels.  
 a) above 30                      b) above 80                      c) above 100                      d) above 120
46. A major nitrogen storage reservoir is,  
 a) River                      b) Atmosphere                      c) Oceans                      d) Trees
47. Hydrological cycle mainly involves,  
 a) Air and Water              b) Sun and Water              c) Animal and Water              d) Mountain and Water
48. Khetri (Rajasthan) is famous for,  
 a) Gold mines                      b) Copper mines                      c) Granite stone                      d) Marble stone
49. Cauvery water dispute is in between,  
 a) India and Pakistan                      b) Punjab and Haryana  
 c) Uttar Pradesh and Madhya Pradesh                      d) Karnataka and Tamilnadu
50. National park concerned with rhinoceros is,  
 a) Corbett                      b) Ranthambore                      c) Kaziranga                      d) Valley of flower

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**First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017**  
**Environmental Studies**

**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 50

**INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the fifty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. Increasing Industrialisation is causing much danger to man's life by
 

|                              |                         |
|------------------------------|-------------------------|
| a) Polluting the environment | b) Producing more goods |
| c) Providing more jobs       | d) Utilizing waste land |
2. The most environmentally friendly method of insect control from the following is
 

|                                    |                                             |
|------------------------------------|---------------------------------------------|
| a) Application of organophosphates | b) Application of chlorinated hydro carbons |
| c) Application of pyrethroids      | d) Crop rotation and Intercropping.         |
3. What does the abbreviation 'GIS' stands for
 

|                                       |                                  |
|---------------------------------------|----------------------------------|
| a) Geographical Information system    | b) Geological Information system |
| c) Geographical Interpretation system | d) Geoscience Information system |
4. Which of the following is likely to be present in photochemical smog?
 

|             |                                |
|-------------|--------------------------------|
| a) Ozone    | b) Peroxyacetyl nitrates (PAN) |
| c) Aldehyde | d) All of these                |
5. Which of the following components of the environment encompass living things?
 

|               |                |                |              |
|---------------|----------------|----------------|--------------|
| a) Atmosphere | b) Hydrosphere | c) Lithosphere | d) Biosphere |
|---------------|----------------|----------------|--------------|
6. Ozone depletion will cause
 

|                                                               |                 |
|---------------------------------------------------------------|-----------------|
| a) More ultraviolet radiation from the sun to reach the earth |                 |
| b) Increased in skin cancer and                               |                 |
| c) Weakening of human immune system                           | d) All of these |
7. Noise is,
 

|                   |                            |
|-------------------|----------------------------|
| a) Loud sound     | b) Unwanted sound          |
| c) Constant sound | d) Sound of high frequency |
8. Which of the following is not a marine pollutant?
 

|        |             |                     |           |
|--------|-------------|---------------------|-----------|
| a) Oil | b) Plastics | c) Dissolved oxygen | d) Sewage |
|--------|-------------|---------------------|-----------|

9. Which of the following components of the environment is responsible for the large scale recycling of matter on earth?  
 a) Atmosphere                      b) Hydrosphere                      c) Lithosphere                      d) Biosphere
10. Deforestation includes areas where, the impact of disturbance, over utilization or changing environmental conditions affects the forest to an extent that it cannot sustain a tree cover above the \_\_\_\_\_ percent threshold.  
 a) 10%                                  b) 30%                                  c) 60%                                  d) 80%
11. In the developing world  
 a) Male population is decreasing                                  b) Male to female ratio is increasing  
 c) Infant mortality is increasing                                  d) Life expectancy is decreasing
12. The pollutants which are emitted directly from identifiable sources are called as  
 a) Secondary pollutants                                  b) Observable pollutants  
 c) Tertiary pollutants                                  d) Primary pollutants
13. Two of the most important atmospheric conditions affecting the dispersion of pollutants are the strength of the wind and the \_\_\_\_\_ of the air  
 a) stability                                  b) depth                                  c) temperature                                  d) pressure
14. The three 'R's to save the environment are  
 a) Reserve, Reduce, Recycle                                  b) Reduce, Recycle, Resuse  
 c) Reserve, Reuse, Reduce                                  d) Reuse, Reserve, Reduce
15. Organic agriculture is  
 a) Ecological management practice                                  b) Ecological production management  
 c) Both (a) & (b)                                  d) None of these
16. The transfer of "Food energy" through a chain of organisms from one trophic level to another is  
 a) Energy chain                      b) Organisms chain                      c) Trophic chain                      d) Food chain
17. The severity of an earthquake is a measure of its seismic waves and is called as  
 a) epicenter                      b) focus                      c) magnitude                      d) ridges
18. The incident of Bhopal gas tragedy occurred on the night of  
 a) December 3<sup>rd</sup> 1984                                  b) December 2<sup>nd</sup> 1984  
 c) December 3<sup>rd</sup> 1982                                  d) December 1<sup>st</sup> 1984
19. Most stable form of rock in the environment is  
 a) Magma                                  b) Igneous rock                                  c) Metamorphic                                  d) Sedimentary rock
20. Which of the following is not true about DDT  
 a) It do not break down rapidly in the environment  
 b) Is more soluble in water than in fat  
 c) It is inexpensive and easy to apply                                  d) It is capable of causing cancer
21. Amrita Devi Bishnoi sacrificed her life to the protection of  
 a) Sal tree                                  b) Pine tree                                  c) Khajri tree                                  d) Alpine
22. What is the primary difference between renewable resources and non renewable resources?  
 a) how easily they are discovered                                  b) the amount of the resources  
 c) the length of time it takes for them to be replenished  
 d) how fast they are being used up.

23. 'Fume' refers to Aerosol consisting of solid particles or a mixture of solid and liquid particles produced by
- a) Chemical reaction  
b) Heat or fire  
c) Heat and chemical reaction  
d) Condensation of hot metal vapour
24. Environmental campaign carried out by public digital media like ND – TV is
- a) save the tiger  
b) save the nature  
c) go green  
d) save the silent valley
25. Acceptability of dams could be improved by
- a) Minimizing the environmental impacts  
b) Compensating for involuntary  
c) By conducting regular monitoring and periodic review  
d) All of these
26. Nuclear power plant in Karnataka is located at
- a) Sandur  
b) Bellary  
c) Kaiga  
d) Raichur
27. Which is one of the "hottest hotspots" of biodiversity in Southern India?
- a) Western Ghats range  
b) Fir forest  
c) Foot hills of Hills of Himalayas  
d) Dandeli
28. World water day will be celebrated every year on
- a) April 1<sup>st</sup>  
b) April 22<sup>nd</sup>  
c) March 22<sup>nd</sup>  
d) December 22<sup>nd</sup>
29. The two structural components of the ecosystem are \_\_\_\_\_
- a) Plants and animals  
b) Plants and light  
c) Abiotic & biotic  
d) Weeds and micro - organisms
30. Narmada Bachao Andolan was led by
- a) Sunderlal Bahuguna  
b) Medha Patkar  
c) Vandana Shiva  
d) Suresh Heblkar
31. Which one of the following groups constitutes the fossil fuels?
- a) Coal, oil and natural gas  
b) Oil, wood pieces and dry dung  
c) Coal, wood pieces and oil  
d) Natural gas, oil and wood pieces
32. The environment which has been made or modified by human and used for their activities is called
- a) Natural environment  
b) Anthrogenic environment  
c) Urban environment  
d) Modern environment
33. The word Environment is derived from French work 'Environs' which means
- a) Air and water  
b) Industrial production  
c) A beautiful landscape  
d) sum total of all condition
34. The top most priority in emergency response to disaster is,
- a) Finance  
b) Assessment of needs  
c) Livelihood and economy  
d) Search and rescue
35. The gradual build up of the concentration of chemicals as they transfer through higher levels of the food chain is called
- a) Biomagnification  
b) Bioconcentration  
c) Biodegradation  
d) Biomethanation
36. Ozone layer is measured in
- a) Centimeters  
b) Millimeters  
c) Decibels  
d) Dobson unit

37. Non point sources of pollution includes all of the following except \_\_\_\_\_  
a) Wind carrying dirt and pesticides from crop lands  
b) A smoke stack from power plant  
c) Run off from stockyards  
d) Fertilizer runoff from agricultural fields.
38. Which one of the following human organ is damaged by fluoride pollution in water  
a) Teeth  
b) Kidney  
c) Brain  
d) Lungs
39. Self assimilation of nutrient from 'photons' the light packets is termed as  
a) Heterotrophy  
b) Photo autotrophy  
c) Autotrophy  
d) Chemotrophy
40. The IS code for potable water is  
a) IS : 10500  
b) IS : 10000  
c) IS : 20000  
d) IS : 2014
41. Succession of life forms that starts in water is called  
a) Hydrobionts  
b) Hydrophytes  
c) Phytoplanktons  
d) Hydrosere
42. 'Silicosis' is prevalent in the  
a) Textile industry  
b) Sugar industry  
c) Stone crushers  
d) Storage battery industries
43. The minimum DO level needed for existence of life forms in water  
a) 1 mg/L  
b) 2 mg/L  
c) 3 mg/L  
d) 4 mg/L
44. The water vapour to Ozone ratio in the healthy troposphere is  
a) 1000 : 1  
b) 1 : 1  
c) 100 : 1  
d) 1 : 1000
45. What is the minimum nutritional requirement of the secured foods?  
a) 1500 cal  
b) 2000 cal  
c) 200 cal  
d) 500 cal
46. Which of the following remote sensing technologies uses sound?  
a) Radar  
b) Sonar  
c) thermal infrared imaging  
d) colour infrared imaging
47. The mile stone marking the birth of the environmental movement was  
a) The Publication of the book silent spring by Rachel Carson in 1962  
b) Chernobyl disaster  
c) Founding of green peace  
d) 1<sup>st</sup> World war
48. The process of conversion of atmospheric nitrogen to available nitrate form is called  
a) Nitrogen synthesis  
b) Denitrification  
c) Nitrification  
d) Nitrifxing.
49. Which of the following is not a key concept that is part of our definition of GIS.  
a) GIS can be used in all areas of modern science  
b) GIS technologies include GPS and remote sensing  
c) GIS includes both computer hardware and software  
d) People are an important part of GIS.
50. The Mars orbiter Mission (MOM), informally called Mangalayaan is India's first Mars orbiter and was launched by the vehicle.  
a) ASLV (Augmented Satellite Launch Vehicle)  
b) PSLV (Polar Satellite Launch Vehicle)  
c) GSLV (Geo synchronous Launch Vehicle).  
d) Ariane - 5.

## CBCS Scheme

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Question Paper Version : A

First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017

**Environmental Studies****(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 40

**INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the forty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Which of the following conceptual spheres of the environmental is having the least storage capacity for matter?  
a) Atmosphere  
b) Lithosphere  
c) Hydrosphere  
d) Biosphere
  2. Biosphere is,  
a) The solid shell of inorganic materials on the surface of the earth.  
b) The thin shell of organic matter on the surface of each comprising of all the living things.  
c) The sphere which occupies the maximum volume of all the spheres.  
d) All of the above.
  3. The earth's atmosphere is an envelope of gases present upto a height of about \_\_\_\_\_ kms.  
a) 10                      b) 200                      c) 1000                      d) 2000
  4. Primary consumer is,  
a) Herbivores              b) Carnivores              c) Macro consumers              d) Omnivores
  5. World environmental day is on,  
a) 5<sup>th</sup> May                      b) 5<sup>th</sup> June                      c) 18<sup>th</sup> July                      d) 16<sup>th</sup> August



6. Green revolution is,  
a) Crop variety improvements  
b) Increased use of fertilizers  
c) Expansion of irrigation  
d) All of these
7. Environmental is the life support system that includes,  
a) Air  
b) Water  
c) Land  
d) All of these
8. The largest reservoir of nitrogen in our planet is,  
a) Oceans  
b) Atmosphere  
c) Biosphere  
d) Fossil fuels
9. Land conversion through burning of biomass releases,  
a) O<sub>2</sub>  
b) CO  
c) N<sub>2</sub>  
d) SO<sub>2</sub>
10. The movement of carbon between \_\_\_\_\_ is called carbon cycle,  
a) Atmosphere and biosphere  
b) Atmosphere and hydrosphere  
c) Geosphere and atmosphere  
d) Biosphere, atmosphere, hydrosphere and geosphere
11. The ground water depends on,  
a) Amount of rain fall  
b) Geological formations  
c) Run off  
d) All of these
12. The important three minerals mined into the maximum extent are,  
a) Coal, petroleum and mercury  
b) Coal, Petroleum and Iron  
c) Petroleum, Radium and Xenon  
d) Helium, Xenon and Coal
13. Respiration and photosynthesis are the keywords related to,  
a) Nitrogen cycle  
b) Sulphur cycle  
c) Carbon cycle  
d) Hydrological cycle.
14. Mining means,  
a) To conserve and preserve minerals  
b) To check pollutions due to mineral resources  
c) To extract minerals and ones  
d) None of these
15. The most important fuel used by nuclear power plant is,  
a) V-235  
b) V-238  
c) V-245  
d) V-248
16. The pH value of the acid rain water is,  
a) 5.7  
b) 7.0  
c) 8.5  
d) 7.5
17. Which of the following is not a Green house gas?  
a) Hydro chloroflourocarbons  
b) Methane  
c) CO<sub>2</sub>  
d) SO<sub>2</sub>

18. E.I.A can be expanded as,  
a) Environment and Industrial Act  
b) Environment and impact activities  
c) Environment Impact Assessment  
d) Environment Important Activity
19. The environmental (protection) act 1986 deals with:  
a) Water  
b) Air  
c) Soil  
d) All of these
20. The first of the major environmental protection act to be promulgated in India was:  
a) The wild life protection act  
b) The air act  
c) The noise pollution act  
d) None of these
21. The meaning of global warming is,  
a) Increase in the temperature of climate  
b) A planet hotter than earth  
c) Solar radiation  
d) Cooling effect
22. Biogas is produced by,  
a) Microbial activity  
b) Harvesting crop  
c) Both (a) and (b)  
d) None of these
23. Biomass consists of,  
a) Lignin  
b) Hemi cellulose  
c) Cellulose  
d) All of these
24. Petroleum based vehicles emit traces of,  
a) CO and NO<sub>x</sub>  
b) SPM  
c) Aldehydes  
d) CH<sub>4</sub>
25. Urbanization is,  
a) Local environmental issue  
b) National environmental issue  
c) Both (a) and (b)  
d) Not at all an issue
26. Noise pollution limits in industrial area,  
a) 45 dB  
b) 80 dB  
c) 65 dB  
d) 90 dB
27. Ozone layers absorbs,  
a) UV rays  
b) Infrared rays  
c) Cosmic rays  
d) CO
28. Water logging is a phenomenon in which,  
a) Crop patterns are related  
b) Plant nutrients  
c) Erosion of soil  
d) None of these
29. The natural nitrogen cycle is upset due to,  
a) Burning of fossil fuel  
b) Modern agricultural practice of releasing excess fertilization.  
c) Global warming  
d) Biogas production

30. Which of the following are natural sources of air pollution?  
 a) Volcanic eruption  
 b) Solar flair  
 c) Earthquake  
 d) All of these
31. Air pollution from automobiles can be controlled by fitting.  
 a) Electrostatic precipitator  
 b) Wet scrubber  
 c) Catalytic converter  
 d) All of these
32. Both power and manure provided by,  
 a) Nuclear plants  
 b) Thermal plants  
 c) Biogas plants  
 d) Hydroelectric plants
33. BOD means,  
 a) Biochemical oxygen demand  
 b) Chemical oxygen demand  
 c) Biophysical oxygen demand  
 d) All of these
34. Deforestation can,  
 a) Increase the rain fall  
 b) Increase soil fertility  
 c) Introduce silt in the rivers  
 d) None of these
35. Organic farming is.  
 a) Farming without using pesticides and chemical fertilizers  
 b) Enhances biodiversity.  
 c) Promotes soil biological activity.  
 d) All of these.
36. Chloro Fluoro Carbon's (CFC) are.  
 a) Non toxic  
 b) Non flammable  
 c) Non carcinogenic  
 d) All of these
37. Which of the following statement is true?  
 a) Green plants are self nourishing  
 b) Producers depends on consumers  
 c) Biotic components includes all non-living components  
 d) Herbivores depend on Carnivores.
38. Major purpose of most of the Dams around the world is,  
 a) Power generation  
 b) Drinking water supply  
 c) Flood control  
 d) Irrigation.
39. Major causes of deforestation are,  
 a) Shifting cultivation  
 b) Fuel requirements  
 c) Raw materials for industries  
 d) All of these
40. Smog is,  
 a) A natural phenomenon  
 b) Combination of smoke and fog  
 c) Colorless  
 d) All of these

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14CHE12/22

**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Engineering Chemistry**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting ONE full question from each module.**

**Module – 1**

- 1 a. Derive Nernst equation for single electrode potential. (05 Marks)
- b. What is reference electrode? Discuss the construction and working of Calomel electrode. (05 Marks)
- c. Explain the following characteristics of battery,
  - (i) Cell potential
  - (ii) Capacity.
  - (iii) Cycle life. (06 Marks)
- d. Discuss the construction and working of Zinc-air battery. (04 Marks)
- 2 a. List out different types of electrodes with an example. (06 Marks)
- b. The emf of the cell  $\text{Cd}/\text{CdSO}_4(0.0093\text{M})//\text{CdSO}_4/\text{Cd}('X'\text{M})$  is 0.086 V at 25°C. Find the value of 'X'. (04 Marks)
- c. What are fuel cells? Compare conventional cell and fuel cell. Mention the advantages of fuel cell. (06 Marks)
- d. Discuss the construction and working of methanol-oxygen fuel cell. (04 Marks)

**Module – 2**

- 3 a. Explain the electrochemical theory of corrosion by taking Iron as an example. (05 Marks)
- b. Explain the following factors affecting the rate of corrosion:
  - (i) Nature of corrosion product.
  - (ii) Polarization of anodic and cathodic regions. (05 Marks)
- c. Discuss decomposition potential which governs the electroplating. (04 Marks)
- d. Explain any three factors which influence the natures of electro deposit. (06 Marks)
- 4 a. Explain waterline corrosion and caustic embrittlement in boilers. (06 Marks)
- b. Discuss Tinning process. (04 Marks)
- c. Explain the electroplating of hard chromium. (05 Marks)
- d. Distinguish electroplating and electroless plating. (05 Marks)

**Module – 3**

- 5 a. Explain the determination of calorific value of a non-volatile liquid fuel using Bomb calorimeter. (05 Marks)
- b. What is reformation of petrol? Write the reactions involved in it. (05 Marks)
- c. Discuss the construction and working of PV-cell. (04 Marks)
- d. Explain module, array and panel of a PV-cell. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Discuss : (i) Antiknocking agents and (ii) Biodiesel. (06 Marks)
- b. Calculate gross and net calorific value of a coal sample from the following data:  
 Weight of coal sample = 0.89 g  
 Weight of water taken in calorimeter = 2600 g,  
 Water equivalent of calorimeter = 350 g,  
 Latent heat of steam = 2465 KJ/kgs  
 Specific heat of water = 4.187 KJ/kg/°C  
 Rise in temperature = 2.8°C  
 % of H<sub>2</sub> in coal sample = 4% (04 Marks)
- c. Discuss the production of solar grade silicon by union carbide process. (06 Marks)
- d. Explain doping of silicon by diffusion technique. (04 Marks)

#### Module – 4

- 7 a. Explain the free radical mechanism of polymerization taking vinyl chloride as a monomer. (06 Marks)
- b. Differentiate between addition and condensation polymerization. (04 Marks)
- c. Give the synthesis reaction of Teflon and polycarbonate. (04 Marks)
- d. Discuss the synthesis, properties and applications of epoxy resin. (06 Marks)
- 8 a. Explain any three structure property relationships of polymers. (06 Marks)
- b. Explain the following factors influencing the T<sub>g</sub>:  
 (i) Flexibility (ii) Branching and Cross linking. (04 Marks)
- c. Discuss the synthesis of carbon fibre. (04 Marks)
- d. What is conducting polymer? Explain the mechanism of conduction in polyaniline and give the applications. (06 Marks)

#### Module – 5

- 9 a. What is boiler feed water? Explain the priming and foaming in boilers. (05 Marks)
- b. Discuss the determination of COD of sewage water. (05 Marks)
- c. What is nanomaterial? Discuss the synthesis of nanomaterial by gas condensation. (05 Marks)
- d. Write a note on carbon nanotubes. (05 Marks)
- 10 a. Explain the activated sludge treatment of sewage water. (05 Marks)
- b. Discuss the Desalination of sea water by reverse osmosis. (05 Marks)
- c. Write a note on nano composites. (05 Marks)
- d. Explain the synthesis of nanomaterial by sol-gel method. (05 Marks)

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# CBCS Scheme

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1SCHE12/22

## First/Second Semester B.E. Degree Examination, June/July 2017 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Write Electrode reactions and Net cell reaction of  
i) Nickel – Metal hydride battery ii) Methanol – oxygen fuel cell. (06 Marks) ✓  
b. Describe the construction and working of Lithium ion battery. (05 Marks) ✓  
c. Derive Nernst equation for Single Electrode Potential. (05 Marks) ✓

### OR

- 2 a. What are Concentration Cells? Calculate the cell potential of the following cell at 298K.  
Ag/Ag Cl (0.005M) // Ag Cl (0.5M)/ Ag (06 Marks)  
b. Explain the measurement of electrode potential using Calomel electrode as secondary reference electrode. (05 Marks)  
c. Define Fuel Cell. What are the differences between Fuel cell and Conventional cell? (05 Marks)

### Module-2

- 3 a. What is Galvanisation and Tinning? Explain Galvanisation process by Hot dipping method. (06 Marks) ✓  
b. Explain Electrochemical theory of corrosion with an example. (05 Marks) ✓  
c. What is Electroplating? What are the differences between Electroplating and Electroless plating? (05 Marks)

### OR

- 4 a. Explain Electroless plating of copper with suitable reactions. (06 Marks)  
b. Describe Electroplating of Nickel using Watt's bath. (05 Marks)  
c. Explain the following factors affecting the rate of corrosion : i) Nature of corrosion product ii) Ratio of Anodic to Cathodic area iii) Conductivity. (05 Marks)

### Module-3

- 5 a. Define Gross calorific and Net calorific value of a fuel. Calculate the gross and net calorific value of a sample of coal from following data : (06 Marks)  
Weight of coal = 0.95g ; Weight of water = 2500g ;  
Water equivalent of calorimeter = 400g ; Specific heat of water = 4.187 J/g / K ;  
Rise in temperature = 3K ; % of Hydrogen in coal = 6  
Latent heat of steam = 2454 J/g/K.  
b. Write a short note on Power Alcohol and Biodiesel. (05 Marks)  
c. Explain Modules, Panels and Arrays of photovoltaic cells. (05 Marks)

### OR

- 6 a. Explain the production of solar grade silicon by Union Carbide process. (06 Marks) ✓  
b. Explain Doping of silicon by diffusion technique to produce n – type and p – type semiconductors. (05 Marks)  
c. Describe Synthesis of petrol by Fischer – Tropsh process. (05 Marks) ✓

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



**Module-4**

- 7- a. Explain Free Radical mechanism of addition polymerisation taking vinyl chloride as an example. (06 Marks)
- b. What are Elastomers? Explain synthesis, properties and applications of silicone rubber. (05 Marks)
- c. What is Glass Transition Temperature? Explain any two factors affecting glass transition temperature. (05 Marks)

**OR**

- 8 a. A polymer is found to contain the following composition : (06 Marks)  
200 molecules of molecular mass 2000 g/mol ,  
300 molecules of molecular mass 3000 g/mol ,  
500 molecules of molecular mass 5000 g/mol. Calculate number average molecular weight and weight average molecular weight of polymer.
- b. Discuss Structure property relationship of polymers with respect to (05 Marks)  
i) Elasticity ii) Chemical resistivity.
- c. Explain the Mechanism of conduction in polyaniline. (05 Marks)

**Module-5**

- 9 a. Write a note on Nanocomposites. Mention its applications. (05 Marks)
- b. Discuss the synthesis of nanomaterials by Sol – gel process and by precipitation method. (06 Marks)
- c. Explain the Activated Sludge treatment of sewage water. (05 Marks)

**OR**

- 10 a. Define BOD. Discuss the experimental determination of BOD of waste water. (06 Marks)
- b. 50cm<sup>3</sup> of sewage water was refluxed with 20cm<sup>3</sup> of 0.1N acidified K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>. The unreacted acidified K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> consumed 10.2cm<sup>3</sup> of 0.1NFAS. 20cm<sup>3</sup> of 0.1N K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> when titrated under identical condition consumed 31.1cm<sup>3</sup> of 0.1NFAS. Calculate the COD of sewage water. (05 Marks)
- c. Write a note on Carbon nanotubes. (05 Marks)

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14PCD13/23

**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Programming in C and Data Structures**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting ONE full question from each module.**

**Module – 1**

- 1 a. What is variable? What is the purpose of variable? What are the rules of variables? (07 Marks)
- b. What is operator? Explain any four operator with an example. (09 Marks)
- c. Define (i) Keyword (ii) Constants (iii) Datatype (iv) Delimiters (04 Marks)
- 2 a. Explain the formatted and unformatted I/O function in C language. Give example for each. (10 Marks)
- b. Write a C program to find the largest of three numbers. (04 Marks)
- c. What is execution character? What are the different escape sequence character in C language? (06 Marks)

**Module – 2**

- 3 a. What is branching? Explain if, if...else and switch with syntax and example. (10 Marks)
- b. Write a C program to generate N prime numbers. (06 Marks)
- c. Explain the significance of goto statement in a C program. (04 Marks)
- 4 a. What is the difference between break and continue statements? Explain with example. (06 Marks)
- b. Write a C program to find the GCD and LCM of two integer numbers. (07 Marks)
- c. What is loop? List and explain the different type of loops. (07 Marks)

**Module – 3**

- 5 a. What is an array? Explain the declaration and initialization of one and two dimensional array. (06 Marks)
- b. What is string? Explain any five string manipulation functions. (06 Marks)
- c. Write a program to find the product of two matrices with suitable messages. (08 Marks)
- 6 a. What is recursion function? Find the factorial of number using recursive function. (06 Marks)
- b. Explain with an example of different passing parameter to function. (08 Marks)
- c. Write a C program to check the given string is palindrome or not. (06 Marks)

**Module – 4**

- 7 a. Explain the structures and function with an example. (08 Marks)
- b. What is structure? Explain with an example of structure declaration and accessing elements. (06 Marks)
- c. Write C program to accept roll no, name, marks of students and display the sum and average the marks. (06 Marks)
- 8 a. What is file? Explain how the file open and file close function. (04 Marks)
- b. Write the concepts of array of structures with a suitable C program. (08 Marks)
- c. Write a C program to read a text file and count numbers of characters, words and lines. (08 Marks)

**Module – 5**

- 9 a. What is pointer? Explain how pointer variables are declared and initialized with example. (04 Marks)
- b. Write a C program using pointer to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers. (10 Marks)
- c. What is dynamic memory allocation? Explain different dynamic memory allocation. (06 Marks)
- 10 a. What is preprocessor? Explain # define preprocessor directive. (04 Marks)
- b. What is data structure? What are primitive and non primitive data types? (04 Marks)
- c. Write note on:  
(i) Stack            (ii) Queue            (iii) Linked list            (iv) Tree (12 Marks)

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# CBCS Scheme

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15PCD13/23

## First/Second Semester B.E. Degree Examination, June/July 2017 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing one full question from each module.**

### Module-1

- 1 a. Define Pseudo code. Explain with an example. (05 Marks)  
b. Write a C program to find biggest among three numbers using ternary operator. (05 Marks)  
c. Explain the following constants with example  
i) Integer constant  
ii) Floating constant  
iii) Character constant. (06 Marks)

**OR**

- 2 a. List the formatted input/output functions of C language. Explain the basic structure of C program with proper syntax and example. (06 Marks)  
b. Define an algorithm. Write an algorithm to find the area of circle and triangle. (06 Marks)  
c. Evaluate the following expression/code segment  
i)  $22 + 3 < 6 \ \&\& \ ! 5 \ || \ 22 == 7 \ \&\& \ 22 - 2 > = 5$   
ii)  $a + 2 > b \ || \ ! c \ \&\& \ a = d \ || \ a - 2 < = e$   
where  $a = 11, b = 6, c = 0, d = 7$  and  $e = 5$  (04 Marks)

### Module-2

- 3 a. List all branching statements. Explain any two with proper syntax and example. (06 Marks)  
b. Explain switch case statement with syntax and example. (05 Marks)  
c. Write a C program to find whether given year is leap year or not. (05 Marks)

**OR**

- 4 a. Write the syntax of all looping control statements. Explain how break and continue statements are used in C program with example. (06 Marks)  
b. Write a C program to find the square root of a given number without using library function. (05 Marks)  
c. List the difference between while and do-while loop. (05 Marks)

### Module-3

- 5 a. Define the array. How one and two dimensional arrays are declared and initialized? Explain. (07 Marks)  
b. Write C program to evaluate the polynomial equation  $f(x) = a_0 + a_1x + a_2x^2 + \dots + a_{n-1}x^{n-1} + a_nx^n$  for given constant 'x' and its co-efficients. (04 Marks)  
c. Explain string Input/output functions with example. (05 Marks)

**OR**

- 6 a. Explain how strings are declared and initialized with syntax and example. (06 Marks)  
b. Write a C program to find the addition of two matrices. (04 Marks)  
c. Explain function definition, function call and function declaration with example. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg.  $42+8=50$ , will be treated as malpractice.

**Module-4**

- 7 a. Define structure. Explain how structure members are accessed using dot (•) operator with example. (05 Marks)
- b. Show how structure variables are passed as a parameter to a function with example. (05 Marks)
- c. Write a C program to maintain record of 'n' students detail using array of structures with four fields (Rno, name, marks, grade). Each field is an appropriate data type. Print the marks of student if student name is given. (06 Marks)

**OR**

- 8 a. Define file. Explain the different modes of file with suitable examples. (08 Marks)
- b. Explain the following file function with example.
- i) fopen ( )
  - ii) fprintf ( )
  - iii) fscanf ( )
  - iv) fgets ( )
- (08 Marks)

**Module-5**

- 9 a. What is pointer? Explain how pointer variable is declared and initialized. (05 Marks)
- b. Explain any two preprocessor directives in C with example. (06 Marks)
- c. Write a C program to swap two numbers using pointer concept. (05 Marks)

**OR**

- 10 a. What are primitive and non primitive data types? Explain. (05 Marks)
- b. List the applications of stack and Queue data structure. (05 Marks)
- c. Write a C program to find sum and mean of all elements in an array using pointer. (06 Marks)

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# CBCS Scheme

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First/Second Semester B.E. Degree Examination, June/July 2017

## Basic Electronics

Time: 3 hrs.

Max. Marks: 80

*Note: Answer FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. Explain briefly the PN junction diode characteristics. (06 Marks)  
b. Explain Zener diode voltage regulator circuit with no load and with load. (06 Marks)  
c. Derive the relationship between  $\alpha$  and  $\beta$ . Calculate the value of  $I_c$  for a transistor that has  $\alpha = 0.98$  and  $I_b = 200 \mu A$ . (04 Marks)

OR

- 2 a. Explain briefly the common emitter circuit and sketch the input and output characteristics. Also explain operating regions by indicating them on characteristics curve. (06 Marks)  
b. With a neat circuit diagram and waveforms, explain the working of a half-wave rectifier. (06 Marks)  
c. Explain briefly capacitor filter circuit. (04 Marks)

### Module-2

- 3 a. What is a DC load line? Explain the voltage divider bias circuit. (08 Marks)  
b. Mention and explain the characteristics of ideal operational amplifier. (04 Marks)  
c. Derive the expression of integrator with circuit diagram. (04 Marks)

OR

- 4 a. With neat circuit and necessary equations, explain the voltage follower. (06 Marks)  
b. Explain the base bias circuit. (04 Marks)  
c. Explain briefly inverting and non-inverting operational amplifiers. (06 Marks)

### Module-3

- 5 a. State and prove De-Morgan's theorem with truth table. (06 Marks)  
b. Explain the basic gates AND, OR and NOT gates with truth tables. (06 Marks)  
c. Explain the half-adder circuit. (04 Marks)

OR

- 6 a. Explain the full-adder circuit. (06 Marks)  
b. Simplify the given Boolean equation  $Y = (A + \bar{B})(CD + E)$  and realize using NAND gates only. (04 Marks)  
c. Convert the following:  
i)  $(49.5)_{10} = ( \quad ? \quad )_{16}$   
ii)  $(1062.403)_8 = ( \quad ? \quad )_{10}$   
iii)  $(642.71)_8 = ( \quad ? \quad )_2$  (06 Marks)

### Module-4

- 7 a. What is R-S flip-flop? Explain its circuit diagram, logic symbol and truth table. (08 Marks)  
b. Explain the architecture of 8051 microcontroller in detail. (08 Marks)



**OR**

- 8 a. Explain the gated R-S flip-flop and clocked R-S flip-flop. (08 Marks)  
b. With the help of block diagram, explain the micro-controller based stepper motor control system. (08 Marks)

**Module-5**

- 9 a. Explain the construction of LVDT and its operation. (06 Marks)  
b. Explain the frequency modulation with neat waveforms. (06 Marks)  
c. Explain with diagram the AM detection (demodulation). (04 Marks)

**OR**

- 10 a. Explain the piezoelectric transducer and photoelectric transducer. (06 Marks)  
b. Explain with block diagram elements of communication system. (06 Marks)  
c. Compare AM and FM modulation. (04 Marks)

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**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Basic Electronics**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing at least two from each part.**

**PART – A**

- 1 a. Choose the correct answers for the following :
- i) The cut in voltage of a silicon diode is about \_\_\_\_\_  
 A) 0.6V                      B) 0.6mV                      C) 1.2V                      D) 1.2mV
- ii) The ripple factor for a full wave rectifier is  
 A) 0.482                      B) 0.5                      C) 1.21                      D) -1.21
- iii) PIV rating of a diode in a bridge rectifier is \_\_\_\_\_  
 A)  $V_m$                       B)  $2V_m$                       C)  $\frac{V_m}{2}$                       D)  $\frac{V_m}{\sqrt{2}}$
- iv) The zener resistance of a zener diode, which exhibits 50mV change in  $V_z$  for a 2.5mA change in  $I_z$  is \_\_\_\_\_  
 A) 10 $\Omega$                       B) 40 $\Omega$                       C) 20 $\Omega$                       D) 60 $\Omega$  (04 Marks)
- b. Draw and explain the V-I characteristics of silicon diode (04 Marks)
- c. Deduce the following for Fullwave rectifier i)  $I_{dc}$                       ii)  $I_{rms}$                       iii) Ripple factor  
 iv) Efficiency of rectification. (08 Marks)
- d. A full wave rectifier (bridge) supplies a load of 400 $\Omega$  in parallel with a capacitor of 500 $\mu$ F. If the ac-supply voltage is 230 sin 314t, V find the i) Ripple factor                      ii) Dc load current. (04 Marks)
- 2 a. Choose the correct answers for the following :
- i) The transistor acts as an amplifier in the \_\_\_\_\_ region.  
 A) cut off                      B) active                      C) saturation                      D) inverse.
- ii) In a transistor the current conduction is due to \_\_\_\_\_ carriers.  
 A) Majority                      B) Minority                      C) Both                      D) None of these.
- iii) The input resistance is highest for \_\_\_\_\_  
 A) CB amplifier                      B) CC amplifier                      C) CE amplifier                      D) None of these.
- iv) The position of Q-point on the dc load line should be \_\_\_\_\_  
 A) stable                      B) unstable                      C) bistable                      D) all the above. (04 Marks)
- b. Draw input and output characteristics of a transistors in common emitter configuration and explain in detail. (04 Marks)
- c. Obtain the relationship between  $\alpha_{dc}$  and  $\beta_{dc}$ . (08 Marks)
- d. Calculate the values of  $I_c$ ,  $I_E$  and  $\beta_{dc}$  for a transistor with  $\alpha_{dc} = 0.98$  and  $I_B = 120\mu$ A. (04 Marks)
- 3 a. Choose the correct answers for the following :
- i) The reverse saturation current doubles for every \_\_\_\_\_  $^{\circ}$ C rise in temperature.  
 A) 40                      B) 45                      C) 10                      D) 50.
- ii) The stability factor "S" as the rate of change of collector current with \_\_\_\_\_  
 A) Base current                      B) Reverse saturation current  
 C) Emitter current                      D)  $V_{cc}$ .
- iii) For an emitter follower, the voltage gain is \_\_\_\_\_  
 A) unity                      B) greater than unity                      C) less than unity                      D) zero.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42÷8 = 50, will be treated as malpractice.

- iv) In the fixed bias circuit, the stabilization of the Q-point is \_\_\_\_\_.  
 A) very poor      B) very high      C) better      D) very good. (04 Marks)
- b. Explain the circuit operation and analysis of voltage divider bias. (08 Marks)
- c. In the circuit shown in Fig. Q3(c), a NPN transistor with  $\beta = 100$  is used. Find  $I_B$ ,  $I_C$  and  $V_{CE}$ . Draw the dc load line and indicate the Q-point. Take  $V_{BE} = 0.7$  volts. (08 Marks)

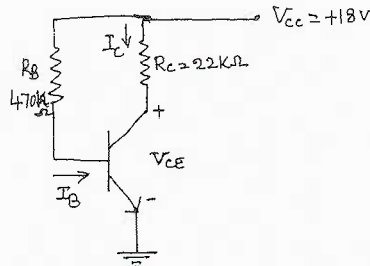


Fig. Q3(c)

- 4 a. Choose the correct answers for the following :
- i) An SCR has \_\_\_\_\_ number of p-n junctions  
 A) One      B) Two      C) Three      D) Four
- ii) FET is a \_\_\_\_\_ controlled device.  
 A) Voltage      B) Current      C) Power      D) None of these.
- iii) The holding current is an SCR is \_\_\_\_\_ the latching current.  
 A) More than      B) Less than      C) Equal to      D) none of these
- iv) A relaxation uses  
 A) MOSFET      B) SCR      C) UJT      D) BJT. (04 Marks)
- b. Draw and explain the V-I characteristic of SCR. (08 Marks)
- c. Explain the basic construction and equivalent circuit of UJT. (08 Marks)

**PART - B**

- 5 a. Choose the correct answers for the following :
- i) Bandwidth of an amplifier is given by \_\_\_\_\_  
 A)  $BW = f_L - f_H$       B)  $BW = f_H - f_L$       C)  $BW = f_L + f_H$       D)  $BW = 2f_L - f_H$
- ii) An amplifier is RC phase shift oscillator contributes \_\_\_\_\_ phase shift.  
 A)  $180^\circ$       B)  $0^\circ$       C)  $90^\circ$       D)  $60^\circ$ .
- iii) The crystal oscillator finds use, when the \_\_\_\_\_ stability is required.  
 A) Amplitude      B) Frequency      C) Phase      D) None of these.
- iv) In an oscillator, we use \_\_\_\_\_ feedback.  
 A) Positive      B) Negative      C) Unity gain      D) None of these. (04 Marks)
- b. Draw a neat circuit diagram of Hartley's oscillator and explain its working. What is the frequency of oscillations? (08 Marks)
- c. With a neat circuit diagram and frequency response, explain the operation of single stage RC coupled amplifier. (08 Marks)
- 6 a. Choose the correct answers for the following :
- i) An audio amplifier works over the frequency range \_\_\_\_\_.  
 A) 20Hz to 20KHz      B) 20Hz to 1MHz      C) 1KHz to 4KHz      D) None of these.
- ii) Op-amp is basically a \_\_\_\_\_ amplifier.  
 A) Power      B) Differential      C) Optical      D) Current.
- iii) In inverting amplifier there is \_\_\_\_\_ phase shift between input and output.  
 A)  $0^\circ$       B)  $90^\circ$       C)  $180^\circ$       D)  $360^\circ$
- iv) The maximum rate at which amplifier output can change in volts per microseconds ( $V/\mu s$ ) is called \_\_\_\_\_.  
 A) over rate      B) slew rate      C) under rate      D) None of these. (04 Marks)

- b. List the characteristics of an ideal op.amp. (06 Marks)
- c. Show with a circuit diagram, how the op-amp can be used as an integrator. (05 Marks)
- d. Find the O/pP voltage of the 3 i/p adder circuit shown below Fig. Q6(d). (05 Marks)

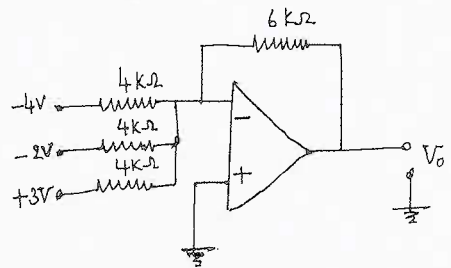


Fig. Q6(d)

- 7 a. Choose the correct answers for the following :
  - i) The radio communication uses \_\_\_\_\_ as communication medium.
    - A) Optical fibre      B) Free space      C) conducting wire      D) None of these.
  - ii) The circuit that recovers the original modulating information from an AM signal is known as
    - A) Modulator      B) Mixer      C) Demodulator      D) Oscillator.
  - iii) 2's complement of binary number 10110 as
    - A) 00011      B) 01010      C) 11100      D) 11111.
  - iv)  $(28)_{10} = ( )_2$ 
    - A) 11100      B) 01110      C) 11000      D) 00011.

(04 Marks)

- b. Explain the need for modulation. (04 Marks)
- c. Draw the block diagram of a super heterodyne receiver and explain the function of each block. (06 Marks)
- d. Perform the following :
  - i) Convert  $(725.25)_8 = ( )_{10} = ( )_2$
  - ii) Subtract using 2's complement  $(4 - 9)_{10}$
  - iii)  $(11010.101)_2 = ( )_8 = ( )_{16}$ .

(06 Marks)

- 8 a. Choose the correct answers for the following :
  - i) Universal gates are \_\_\_\_\_ and \_\_\_\_\_.
    - A) NOT and NOR      B) AND or OR      C) NAND and NOR      D) EX-OR and EX-NOR.
  - ii)  $(A+B)(B+C) =$  \_\_\_\_\_
    - A)  $B + \bar{A}C$       B)  $B + \bar{B}C$       C)  $B + AC$       D)  $AB$ .
  - iii) The output is high, when all the inputs are low, such a gate is called \_\_\_\_\_.
    - A) NAND      B) AND      C) OR      D) EX-OR
  - iv) Full adder has \_\_\_\_\_ inputs.
    - A) 1      B) 2      C) 3      D) 4.

(04 Marks)

- b. State and prove De Morgan's theorem. (04 Marks)
- c. Simplify
  - i)  $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + AB\bar{C}$ , realize using basic gates.
  - ii)  $(A + \bar{B} + C)(\bar{A} + B + C)$ , realize using two input NAND gates.
- d. Realize a full adder using 2 Half adder and OR gate. (04 Marks)

(08 Marks)

(04 Marks)

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**First/Second Semester B.E Degree Examination, June /July 2017**

**Environmental Studies**

**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 50

**INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the fifty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. The Earth is surrounded by a blanket of air which is referred to as  
 a) Atmosphere                      b) Biosphere                      c) Hydrosphere                      d) Lithosphere
2. The term Biosphere was coined by scientist from  
 a) Romania                      b) Russia                      c) Spain                      d) Sweden
3. The mantle supporting lithosphere is known as  
 a) Asthenosphere                      b) Mantle                      c) Magma                      d) Lava
4. The by – product in Autotrophs is  
 a) Carbon                      b) Oxygen                      c) Nitrogen                      d) Hydrogen
5. Fungi and Bacteria are  
 a) Producers                      b) Hyterotrophs                      c) Consumers                      d) Decomposers
6. Transpiration by plants is affected by  
 a) Temperature                      b) Pressure                      c) Humidity                      d) Gravity
7. The process leading to soil depletion in situ is known as  
 a) Soil degradation                      b) Soil erosion                      c) Urbanization                      d) None

8. Aggregation of clay into sand – sized grains is by  
a) Vegetation                      b) Wild fire                      c) Conservation                      d) Overgrazing
9. Removal of trees cause  
a) Loss of biodiversity                      b) Ecological impact                      c) Soil erosion                      d) All of these
10. Consumption of fossil fuels result in  
a) Ozone depletion                      b) Global warming                      c) both                      d) None of the above
11. Marine Iguanas were killed due to oil spill at  
a) Santa Fe                      b) Andaman                      c) Nicobar                      d) Lakshadweep
12. Arsenic , Fluorides , Phosphates emit from  
a) Diary plants                      b) Distillery unit                      c) Fertilizer plant                      d) Tanneries
13. Mercaptanes is a gaseous effluent characteristic of  
a) Tanneries                      b) Chemical industry                      c) Petrochemicals                      d) All of these
14. As per IS : 10500 -- 2003, maximum limit of turbidity is  
a) 5 NTU                      b) 10 NTU                      c) 15 NTU                      d) 20 NTU
15. Typhoid is a disease due to presence of  
a) Bacteria                      b) Fungus                      c) Virus                      d) All
16. Water borne diseases include  
a) Polio                      b) Meningitis                      c) Cholera                      d) All
17. Raw sewage used as fertilizer resulted in cholera at  
a) Palestine                      b) Peru                      c) Paraguay                      d) Panama
18. Methaemoglobinemia is a syndrome due to excess of  
a) Nitrates                      b) Phosphates                      c) Chlorides                      d) Sulphates
19. Limestone reefs are built up by  
a) Corals                      b) Algae                      c) Both                      d) None of these
20. Coal is a dirty fuel because it emits  
a) CO<sub>2</sub>                      b) SO<sub>2</sub>                      c) NO<sub>2</sub>                      d) All
21. Wet gas contains low amounts of  
a) Propane                      b) Pentane                      c) Methane                      d) Hexane
22. Chemical added to detect any leakage of LPG is  
a) Trihydrothiophe                      b) Trinitrothiophene  
c) Tritrohythiophene                      d) Tritronitrothiophene
23. Huge radioactive fallout on life across Europe is due to nuclear disaster at  
a) Cambodia                      b) Cameroon                      c) Chernobyl                      d) Cape Town



24. Nuclear power plant in Karnataka is Situated in  
a) Karwar                      b) Kaiga                      c) Kudremukh                      d) None
25. Tidal energy schemes in India is being experimented in  
a) Mumbai                      b) Kerala                      c) Tamilnadu                      d) Orissa
26. Coal mines result in enhancing hardness of water due to emission of  
a) Sulphuric acid                      b) Nitric acid                      c) Phosphoric acid                      d) All
27. Accelerated Algae and water plant growth is  
a) Putrefaction                      b) Eutrophication                      c) Denitrification                      d) None
28. Silting is encouraged due to photosynthesis of  
a) Algae                      b) Bacteria                      c) Corals                      d) Planktons
29. The word soil is derived from  
a) English                      b) French                      c) Latin                      d) Italian
30. Source of soil pollution is due to  
a) Mining                      b) Biological agents                      c) Urban wastes                      d) All of these
31. Common viruses present in sewage are  
a) Adeno viruses                      b) Anterioviruses                      c) Glutoviruses                      d) All of these
32. Process in which MSW is decomposed is known as  
a) Sanitary landfill                      b) Composting                      c) Incineration                      d) None
33. Progress of a nation depends on  
a) Population density                      b) Literacy rates                      c) Family size                      d) All of these
34. Country not belonging to G7 is  
a) Canada                      b) Britain                      c) Cambodia                      d) Germany
35. Population growth is not the cause of poverty according to  
a) Karl Marx                      b) Napoleon                      c) Nelson Mandela                      d) Lincoln
36. Key remedy for fast population growth happens to be  
a) Prosperity                      b) Nutrition                      c) Social security                      d) All these
37. Major Green House Gas is  
a) CO<sub>2</sub>                      b) CH<sub>4</sub>                      c) CFC                      d) O<sub>3</sub>
38. Kyoto protocol was opened for signature on  
a) February 16, 1998                      b) March 16, 1998                      c) April 16, 1998                      d) May 16, 1998
39. 'Acid Rain' was coined by  
a) Albert Rogers                      b) Albert Agnus                      c) Robert Angus                      d) Alfred Rogers
40. Acid rain can be  
a) Dry                      b) Wet                      c) Both                      d) None of these

41. Lowest  $P^H$  recorded in rainwater is  
a) 1.5                      b) 2.5                      c) 3.5                      d) 4.5
42. Primary cause of acid rain is due to presence of  
a)  $SO_2$                       b)  $CO_2$                       c)  $NO_2$                       d)  $P_2O_5$
43. Invaluable stone statues are partially dissolved by acid rain in  
a) Sweden                      b) Greece                      c) Ukraine                      d) Uganda
44. Acid rain has become an invisible threat particularly in  
a) Turkey                      b) Tuvalu                      c) Japan                      d) Jordan
45. U.N. conference on Human Environment held in  
a) Manchester                      b) Glasgow                      c) Stockholm                      d) Liverpool
46. Air Act extends to  
a) North India                      b) South Central India  
c) Whole of India                      d) Includes Pakistan
47. Water Act in the first instance applies to  
a) Tamilnadu                      b) Andhra Pradesh                      c) Karnataka                      d) Maharashtra
48. Wild Life Act extends in India except  
a) Karnataka                      b) Kerala                      c) Kashmir                      d) Assam
49. On 29<sup>th</sup> April 1999, NGO's are signified by UN  
a) President                      b) Secretary General                      c) Chief                      d) All
50. Guiding principles for Environmental Education were formulated at conference held in  
a) New York                      b) Tbilisi                      c) Los Angeles                      d) Brimingham

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# CBCS Scheme

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Question Paper Version : B

**First/Second Semester B.E Degree Examination, June / July 2017**  
**Environmental Studies**

**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 40

### INSTRUCTIONS TO THE CANDIDATES

1. Answer all the forty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. Which of the following is considered as an alternate fuel?  
 a) CNG                      b) Kerosine                      c) Coal                      d) Petrol
2. Wind Farms are located in,  
 a) River basin                      b) Plain area                      c) Hilly area                      d) Valley area
3. Hydrogen energy can be tapped through,  
 a) Heat pumps                      b) Fuel cells                      c) Photovoltaic cell                      d) Gasifier
4. With Minimum resource maximum energy can be created by,  
 a) Solar radiation                      b) Wind                      c) Nuclear fuels                      d) Tidal waves
5. Nuclear fusion uses the following as a fuel,  
 a) Carbon                      b) Helium                      c) Hydrogen                      d) Water
6. Biogas is gaseous fuel composed mainly of,  
 a) Methane and carbon dioxide                      b) Methane and hydrogen sulphide  
 c) Methane and Carbon monoxide                      d) None of these

7. Reduction in brightness of the famous Taj Mahal is due to,  
a) Global warming    b) Air pollution    c) Ozone depletion    d) Afforestation
8. Ozone layer thickness is measured in,  
a) PPM    b) PPB    c) Decibels    d) Dobson units
9. Bhopal gas tragedy caused due to leakage of,  
a) Methyl Iso Cyanate    b) Sulphur dioxide    c) Hydrogen Sulphide    d) Methane
10. Septic tank is,  
a) An aerobic attached growth treatment system  
b) An aerobic suspended growth biological treatment system  
c) An aerobic attached growth biological treatment system.  
d) An aerobic suspended growth treatment system.
11. Sound that is safest to the human ear should not exceed,  
a) 45 Db    b) 125 Db    c) 70 Db    d) 85 Db
12. Scientific means of M.S.W management involves,  
a) Collection and transport    b) Segregation  
c) Safe disposal    d) All of these
13. Cow dung can be used,  
a) as manure    b) for production of Bio gas  
c) as fuel    d) All of these
14. Biomedical waste can be disposed off by,  
a) Incineration    b) Autoclaving and Land filling  
c) Both (a) and (b)    d) None of these
15. The objectives of Integrated Child Development Services (ICDS) are,  
a) Immunization    b) Health check up and referral services.  
c) Pre-school non-formal education    d) All of these
16. The international protocol to protect the ozone layer is,  
a) Montreal protocol    b) The Vienna protocol  
c) Kyoto protocol    d) Cartagena protocol
17. Environmental (protection) act was enacted in the year,  
a) 1986    b) 1992    c) 1984    d) 1974
18. The forest (conservation) act was enacted in the year,  
a) 1986    b) 1974    c) 1994    d) 1972
19. The leader of Chipko movement is,  
a) Sunderlal Bahuguna    b) Medha Patkar    c) Vandana Shiva    d) Suresh Hebliker

24

15CIV18/28

20. Chernobyl Nuclear disaster occurred in the year,  
a) 1984                              b) 1985                              c) 1986                              d) 1987
21. The computer driven system that permits storing and retrieving environmental information,  
a) GIS                              b) Digital information              c) Information technology              d) None of these
22. Bacteria that are commonly associated with root nodules are,  
a) Rhizobium                      b) Bacillus                              c) Pseudomonas                      d) None of these
23. Earth's fresh water reserves are about,  
a) 2.6%                              b) 26%                              c) 0.26%                              d) 1.6%
24. The Earth is believed to have come to existence some,  
a) 3.5 billion years ago                              b) 4.5 billion years ago  
c) 4.5 million years ago                              d) 5.5 million years ago
25. The term environment has been derived from French word which means to encircle or surround.  
a) Environ                              b) Oikor                              c) Geo                              d) Aqua
26. Which of the following component of the environment are effective transport of matter?  
a) Atmosphere and hydrosphere                              b) Atmosphere and Lithosphere  
c) Hydrosphere and Lithosphere                              d) Lithosphere and hydrosphere.
27. Which of the following is a biotic component of an ecosystem:  
a) Fungi                              b) Solar light                              c) Temperature                              d) Humidity
28. The sequence of eating and being eaten in an ecosystem is called,  
a) Food chain                              b) Carbon cycle                              c) Hydrological cycle                              d) None of these
29. Primary consumer is,  
a) Herbivores                              b) Carnivores                              c) Macro consumer                              d) Omni vores
30. The Major atmospheric gas layer in stratosphere is,  
a) Hydrogen                              b) Carbon dioxide                              c) Ozone                              d) Oxygen
31. A food web consists of,  
a) a portion of a food chain                              b) an organisms position in a food chain  
c) Interlocking of food chain                              d) a set of similar consumer
32. India has a world's largest share of which of the following:  
a) Manganese                              b) Mica                              c) Copper                              d) Diamond
33. Major purpose of most of the dams around the world is,  
a) Power generation              b) Irrigation                              c) Drinking water supply              d) Flood control
34. The Permissible range of pH for drinking water as per the Indian standard,  
a) 6 to 9                              b) 6.5 to 7.5                              c) 6 to 8.5                              d) 6.5 to 8.5

35. Excess of fluorides in drinking water is likely to cause,  
a) Blue babies            b) Fluorosis            c) Taste and Odour            d) Colour
36. The largest reservoir of nitrogen on our planet is,  
a) Ocean            b) Atmosphere            c) Biosphere            d) Fossil fuels
37. Mining means,  
a) Conserve and Preserve minerals            b) Check pollution due to mineral resource  
c) Extract minerals and ores            d) None of these
38. E.I.A can be expanded as,  
a) Environment and Industrila act            b) Environmental Impact activity  
c) Environmental Impact Assessment            d) Environmentally important activity.
39. "Earth Day" is held every year on,  
a) June 5<sup>th</sup>            b) November 23<sup>rd</sup>            c) April 22<sup>nd</sup>            d) May 16
40. Water logging is a phenomena in which,  
a) Crop patterns are rotated            b) Soil root zone becomes saturated due to over irrigation,  
c) Erosion of soil            d) None of these

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14CHE12/22

**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Engineering Chemistry**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting ONE full question from each module.**

**Module – 1**

- 1 a. Derive Nernst equation for single electrode potential. (05 Marks)
- b. What is reference electrode? Discuss the construction and working of Calomel electrode. (05 Marks)
- c. Explain the following characteristics of battery,
  - (i) Cell potential
  - (ii) Capacity.
  - (iii) Cycle life. (06 Marks)
- d. Discuss the construction and working of Zinc-air battery. (04 Marks)
- 2 a. List out different types of electrodes with an example. (06 Marks)
- b. The emf of the cell  $\text{Cd}/\text{CdSO}_4(0.0093\text{M})//\text{CdSO}_4/\text{Cd}('X'\text{M})$  is 0.086 V at 25°C. Find the value of 'X'. (04 Marks)
- c. What are fuel cells? Compare conventional cell and fuel cell. Mention the advantages of fuel cell. (06 Marks)
- d. Discuss the construction and working of methanol-oxygen fuel cell. (04 Marks)

**Module – 2**

- 3 a. Explain the electrochemical theory of corrosion by taking Iron as an example. (05 Marks)
- b. Explain the following factors affecting the rate of corrosion:
  - (i) Nature of corrosion product.
  - (ii) Polarization of anodic and cathodic regions. (05 Marks)
- c. Discuss decomposition potential which governs the electroplating. (04 Marks)
- d. Explain any three factors which influence the natures of electro deposit. (06 Marks)
- 4 a. Explain waterline corrosion and caustic embrittlement in boilers. (06 Marks)
- b. Discuss Tinning process. (04 Marks)
- c. Explain the electroplating of hard chromium. (05 Marks)
- d. Distinguish electroplating and electroless plating. (05 Marks)

**Module – 3**

- 5 a. Explain the determination of calorific value of a non-volatile liquid fuel using Bomb calorimeter. (05 Marks)
- b. What is reformation of petrol? Write the reactions involved in it. (05 Marks)
- c. Discuss the construction and working of PV-cell. (04 Marks)
- d. Explain module, array and panel of a PV-cell. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Discuss : (i) Antiknocking agents and (ii) Biodiesel. (06 Marks)
- b. Calculate gross and net calorific value of a coal sample from the following data:  
 Weight of coal sample = 0.89 g  
 Weight of water taken in calorimeter = 2600 g,  
 Water equivalent of calorimeter = 350 g,  
 Latent heat of steam = 2465 KJ/kgs  
 Specific heat of water = 4.187 KJ/kg/°C  
 Rise in temperature = 2.8°C  
 % of H<sub>2</sub> in coal sample = 4% (04 Marks)
- c. Discuss the production of solar grade silicon by union carbide process. (06 Marks)
- d. Explain doping of silicon by diffusion technique. (04 Marks)

#### Module – 4

- 7 a. Explain the free radical mechanism of polymerization taking vinyl chloride as a monomer. (06 Marks)
- b. Differentiate between addition and condensation polymerization. (04 Marks)
- c. Give the synthesis reaction of Teflon and polycarbonate. (04 Marks)
- d. Discuss the synthesis, properties and applications of epoxy resin. (06 Marks)
- 8 a. Explain any three structure property relationships of polymers. (06 Marks)
- b. Explain the following factors influencing the T<sub>g</sub>:  
 (i) Flexibility (ii) Branching and Cross linking. (04 Marks)
- c. Discuss the synthesis of carbon fibre. (04 Marks)
- d. What is conducting polymer? Explain the mechanism of conduction in polyaniline and give the applications. (06 Marks)

#### Module – 5

- 9 a. What is boiler feed water? Explain the priming and foaming in boilers. (05 Marks)
- b. Discuss the determination of COD of sewage water. (05 Marks)
- c. What is nanomaterial? Discuss the synthesis of nanomaterial by gas condensation. (05 Marks)
- d. Write a note on carbon nanotubes. (05 Marks)
- 10 a. Explain the activated sludge treatment of sewage water. (05 Marks)
- b. Discuss the Desalination of sea water by reverse osmosis. (05 Marks)
- c. Write a note on nano composites. (05 Marks)
- d. Explain the synthesis of nanomaterial by sol-gel method. (05 Marks)

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# CBCS Scheme

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15CHE12/22

## First/Second Semester B.E. Degree Examination, June/July 2017 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Write Electrode reactions and Net cell reaction of  
i) Nickel – Metal hydride battery ii) Methanol – oxygen fuel cell. (06 Marks)  
b. Describe the construction and working of Lithium ion battery. (05 Marks)  
c. Derive Nernst equation for Single Electrode Potential. (05 Marks)

OR

- 2 a. What are Concentration Cells? Calculate the cell potential of the following cell at 298K.  
Ag/Ag Cl (0.005M) // Ag Cl (0.5M)/ Ag (06 Marks)  
b. Explain the measurement of electrode potential using Calomel electrode as secondary reference electrode. (05 Marks)  
c. Define Fuel Cell. What are the differences between Fuel cell and Conventional cell? (05 Marks)

### Module-2

- 3 a. What is Galvanisation and Tinning? Explain Galvanisation process by Hot dipping method. (06 Marks)  
b. Explain Electrochemical theory of corrosion with an example. (05 Marks)  
c. What is Electroplating? What are the differences between Electroplating and Electroless plating? (05 Marks)

OR

- 4 a. Explain Electroless plating of copper with suitable reactions. (06 Marks)  
b. Describe Electroplating of Nickel using Watt's bath. (05 Marks)  
c. Explain the following factors affecting the rate of corrosion : i) Nature of corrosion product  
ii) Ratio of Anodic to Cathodic area iii) Conductivity. (05 Marks)

### Module-3

- 5 a. Define Gross calorific and Net calorific value of a fuel. Calculate the gross and net calorific value of a sample of coal from following data : (06 Marks)  
Weight of coal = 0.95g ; Weight of water = 2500g ;  
Water equivalent of calorimeter = 400g ; Specific heat of water = 4.187 J/g / K ;  
Rise in temperature = 3K ; % of Hydrogen in coal = 6  
Latent heat of steam = 2454 J/g/K.  
b. Write a short note on Power Alcohol and Biodiesel. (05 Marks)  
c. Explain Modules, Panels and Arrays of photovoltaic cells. (05 Marks)

OR

- 6 a. Explain the production of solar grade silicon by Union Carbide process. (06 Marks)  
b. Explain Doping of silicon by diffusion technique to produce n – type and p – type semiconductors. (05 Marks)  
c. Describe Synthesis of petrol by Fischer – Tropsch process. (05 Marks)

**Module-4**

- 7 a. Explain Free Radical mechanism of addition polymerisation taking vinyl chloride as an example. (06 Marks)
- b. What are Elastomers? Explain synthesis, properties and applications of silicone rubber. (05 Marks)
- c. What is Glass Transition Temperature? Explain any two factors affecting glass transition temperature. (05 Marks)

**OR**

- 8 a. A polymer is found to contain the following composition : (06 Marks)  
200 molecules of molecular mass 2000 g/mol ,  
300 molecules of molecular mass 3000 g/mol ,  
500 molecules of molecular mass 5000 g/mol. Calculate number average molecular weight and weight average molecular weight of polymer.
- b. Discuss Structure property relationship of polymers with respect to (05 Marks)  
i) Elasticity ii) Chemical resistivity.
- c. Explain the Mechanism of conduction in polyaniline. (05 Marks)

**Module-5**

- 9 a. Write a note on Nanocomposites. Mention its applications. (05 Marks)
- b. Discuss the synthesis of nanomaterials by Sol – gel process and by precipitation method. (06 Marks)
- c. Explain the Activated Sludge treatment of sewage water. (05 Marks)

**OR**

- 10 a. Define BOD. Discuss the experimental determination of BOD of waste water. (06 Marks)
- b. 50cm<sup>3</sup> of sewage water was refluxed with 20cm<sup>3</sup> of 0.1N acidified K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>. The unreacted acidified K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> consumed 10.2cm<sup>3</sup> of 0.1NFAS. 20cm<sup>3</sup> of 0.1N K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> when titrated under identical condition consumed 31.1cm<sup>3</sup> of 0.1NFAS. Calculate the COD of sewage water. (05 Marks)
- c. Write a note on Carbon nanotubes. (05 Marks)

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14PCD13/23

**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Programming in C and Data Structures**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting ONE full question from each module.**

**Module – 1**

- 1 a. What is variable? What is the purpose of variable? What are the rules of variables?(07 Marks)
- b. What is operator? Explain any four operator with an example. (09 Marks)
- c. Define (i) Keyword (ii) Constants (iii) Datatype (iv) Delimiters (04 Marks)
- 2 a. Explain the formatted and unformatted I/O function in C language. Give example for each. (10 Marks)
- b. Write a C program to find the largest of three numbers. (04 Marks)
- c. What is execution character? What are the different escape sequence character in C language? (06 Marks)

**Module – 2**

- 3 a. What is branching? Explain if, if...else and switch with syntax and example. (10 Marks)
- b. Write a C program to generate N prime numbers. (06 Marks)
- c. Explain the significance of goto statement in a C program. (04 Marks)
- 4 a. What is the difference between break and continue statements? Explain with example. (06 Marks)
- b. Write a C program to find the GCD and LCM of two integer numbers. (07 Marks)
- c. What is loop? List and explain the different type of loops. (07 Marks)

**Module – 3**

- 5 a. What is an array? Explain the declaration and initialization of one and two dimensional array. (06 Marks)
- b. What is string? Explain any five string manipulation functions. (06 Marks)
- c. Write a program to find the product of two matrices with suitable messages. (08 Marks)
- 6 a. What is recursion function? Find the factorial of number using recursive function. (06 Marks)
- b. Explain with an example of different passing parameter to function. (08 Marks)
- c. Write a C program to check the given string is palindrome or not. (06 Marks)

**Module – 4**

- 7 a. Explain the structures and function with an example. (08 Marks)
- b. What is structure? Explain with an example of structure declaration and accessing elements. (06 Marks)
- c. Write C program to accept roll no, name, marks of students and display the sum and average the marks. (06 Marks)
- 8 a. What is file? Explain how the file open and file close function. (04 Marks)
- b. Write the concepts of array of structures with a suitable C program. (08 Marks)
- c. Write a C program to read a text file and count numbers of characters, words and lines. (08 Marks)

**Module – 5**

- 9 a. What is pointer? Explain how pointer variables are declared and initialized with example. (04 Marks)
- b. Write a C program using pointer to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers. (10 Marks)
- c. What is dynamic memory allocation? Explain different dynamic memory allocation. (06 Marks)
- 10 a. What is preprocessor? Explain # define preprocessor directive. (04 Marks)
- b. What is data structure? What are primitive and non primitive data types? (04 Marks)
- c. Write note on:  
(i) Stack            (ii) Queue            (iii) Linked list            (iv) Tree (12 Marks)

\* \* \* \* \*



# CBCS Scheme

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15PCD13/23

## First/Second Semester B.E. Degree Examination, June/July 2017 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing one full question from each module.**

### Module-1

- 1 a. Define Pseudo code. Explain with an example. (05 Marks)  
b. Write a C program to find biggest among three numbers using ternary operator. (05 Marks)  
c. Explain the following constants with example (06 Marks)  
i) Integer constant  
ii) Floating constant  
iii) Character constant.

OR

- 2 a. List the formatted input/output functions of C language. Explain the basic structure of C program with proper syntax and example. (06 Marks)  
b. Define an algorithm. Write an algorithm to find the area of circle and triangle. (06 Marks)  
c. Evaluate the following expression/code segment (04 Marks)  
i)  $22 + 3 < 6 \ \&\& \ ! 5 \ || \ 22 == 7 \ \&\& \ 22 - 2 > = 5$   
ii)  $a + 2 > b \ || \ ! c \ \&\& \ a == d \ || \ a - 2 < = e$   
where  $a = 11, b = 6, c = 0, d = 7$  and  $e = 5$

### Module-2

- 3 a. List all branching statements. Explain any two with proper syntax and example. (06 Marks)  
b. Explain switch case statement with syntax and example. (05 Marks)  
c. Write a C program to find whether given year is leap year or not. (05 Marks)

OR

- 4 a. Write the syntax of all looping control statements. Explain how break and continue statements are used in C program with example. (06 Marks)  
b. Write a C program to find the square root of a given number without using library function. (05 Marks)  
c. List the difference between while and do-while loop. (05 Marks)

### Module-3

- 5 a. Define the array. How one and two dimensional arrays are declared and initialized? Explain. (07 Marks)  
b. Write C program to evaluate the polynomial equation  $f(x) = a_0 + a_1x + a_2x^2 + \dots + a_{n-1}x^{n-1} + a_nx^n$  for given constant 'x' and its co-efficients. (04 Marks)  
c. Explain string Input/output functions with example. (05 Marks)

OR

- 6 a. Explain how strings are declared and initialized with syntax and example. (06 Marks)  
b. Write a C program to find the addition of two matrices. (04 Marks)  
c. Explain function definition, function call and function declaration with example. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-4**

- 7 a. Define structure. Explain how structure members are accessed using dot (•) operator with example. (05 Marks)
- b. Show how structure variables are passed as a parameter to a function with example. (05 Marks)
- c. Write a C program to maintain record of 'n' students detail using array of structures with four fields (Rno, name, marks, grade). Each field is an appropriate data type. Print the marks of student if student name is given. (06 Marks)

**OR**

- 8 a. Define file. Explain the different modes of file with suitable examples. (08 Marks)
- b. Explain the following file function with example. (08 Marks)
- i) fopen ( )
  - ii) fprintf ( )
  - iii) fscanf ( )
  - iv) fgets ( )

**Module-5**

- 9 a. What is pointer? Explain how pointer variable is declared and initialized. (05 Marks)
- b. Explain any two preprocessor directives in C with example. (06 Marks)
- c. Write a C program to swap two numbers using pointer concept. (05 Marks)

**OR**

- 10 a. What are primitive and non primitive data types? Explain. (05 Marks)
- b. List the applications of stack and Queue data structure. (05 Marks)
- c. Write a C program to find sum and mean of all elements in an array using pointer. (06 Marks)

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# GBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2017

## Basic Electronics

Time: 3 hrs.

Max. Marks: 80

*Note: Answer FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. Explain briefly the PN junction diode characteristics. (06 Marks)  
b. Explain Zener diode voltage regulator circuit with no load and with load. (06 Marks)  
c. Derive the relationship between  $\alpha$  and  $\beta$ . Calculate the value of  $I_c$  for a transistor that has  $\alpha = 0.98$  and  $I_b = 200 \mu A$ . (04 Marks)

OR

- 2 a. Explain briefly the common emitter circuit and sketch the input and output characteristics. Also explain operating regions by indicating them on characteristics curve. (06 Marks)  
b. With a neat circuit diagram and waveforms, explain the working of a half-wave rectifier. (06 Marks)  
c. Explain briefly capacitor filter circuit. (04 Marks)

### Module-2

- 3 a. What is a DC load line? Explain the voltage divider bias circuit. (08 Marks)  
b. Mention and explain the characteristics of ideal operational amplifier. (04 Marks)  
c. Derive the expression of integrator with circuit diagram. (04 Marks)

OR

- 4 a. With neat circuit and necessary equations, explain the voltage follower. (06 Marks)  
b. Explain the base bias circuit. (04 Marks)  
c. Explain briefly inverting and non-inverting operational amplifiers. (06 Marks)

### Module-3

- 5 a. State and prove De-Morgan's theorem with truth table. (06 Marks)  
b. Explain the basic gates AND, OR and NOT gates with truth tables. (06 Marks)  
c. Explain the half-adder circuit. (04 Marks)

OR

- 6 a. Explain the full-adder circuit. (06 Marks)  
b. Simplify the given Boolean equation  $Y = (A + \bar{B})(CD + E)$  and realize using NAND gates only. (04 Marks)  
c. Convert the following:  
i)  $(49.5)_{10} = ( \quad ? \quad )_{16}$   
ii)  $(1062.403)_8 = ( \quad ? \quad )_{10}$   
iii)  $(642.71)_8 = ( \quad ? \quad )_2$  (06 Marks)

### Module-4

- 7 a. What is R-S flip-flop? Explain its circuit diagram, logic symbol and truth table. (08 Marks)  
b. Explain the architecture of 8051 microcontroller in detail. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**OR**

- 8 a. Explain the gated R-S flip-flop and clocked R-S flip-flop. (08 Marks)  
b. With the help of block diagram, explain the micro-controller based stepper motor control system. (08 Marks)

**Module-5**

- 9 a. Explain the construction of LVDT and its operation. (06 Marks)  
b. Explain the frequency modulation with neat waveforms. (06 Marks)  
c. Explain with diagram the AM detection (demodulation). (04 Marks)

**OR**

- 10 a. Explain the piezoelectric transducer and photoelectric transducer. (06 Marks)  
b. Explain with block diagram elements of communication system. (06 Marks)  
c. Compare AM and FM modulation. (04 Marks)

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10ELN/15/25

**First/Second Semester B.E. Degree Examination, June/July 2017**  
**Basic Electronics**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, choosing at least two from each part.**

**PART – A**

- 1 a. Choose the correct answers for the following :
- The cut in voltage of a silicon diode is about \_\_\_\_\_  
 A) 0.6V                      B) 0.6mV                      C) 1.2V                      D) 1.2mV
  - The ripple factor for a full wave rectifier is \_\_\_\_\_  
 A) 0.482                      B) 0.5                      C) 1.21                      D) -1.21
  - PIV rating of a diode in a bridge rectifier is \_\_\_\_\_  
 A)  $V_m$                       B)  $2V_m$                       C)  $\frac{V_m}{2}$                       D)  $\frac{V_m}{\sqrt{2}}$
  - The zener resistance of a zener diode, which exhibits 50mV change in  $V_z$  for a 2.5mA change in  $I_z$  is \_\_\_\_\_  
 A)  $10\Omega$                       B)  $40\Omega$                       C)  $20\Omega$                       D)  $60\Omega$  (04 Marks)
- b. Draw and explain the V-I characteristics of silicon diode (04 Marks)
- c. Deduce the following for Fullwave rectifier i)  $I_{dc}$       ii)  $I_{rms}$       iii) Ripple factor  
 iv) Efficiency of rectification. (08 Marks)
- d. A full wave rectifier (bridge) supplies a load of  $400\Omega$  in parallel with a capacitor of  $500\mu F$ . If the ac-supply voltage is  $230 \sin 314t$ , V find the i) Ripple factor    ii) Dc load current. (04 Marks)
- 2 a. Choose the correct answers for the following :
- The transistor acts as an amplifier in the \_\_\_\_\_ region.  
 A) cut off                      B) active                      C) saturation                      D) inverse.
  - In a transistor the current conduction is due to \_\_\_\_\_ carriers.  
 A) Majority                      B) Minority                      C) Both                      D) None of these.
  - The input resistance is highest for \_\_\_\_\_  
 A) CB amplifier                      B) CC amplifier                      C) CE amplifier                      D) None of these.
  - The position of Q-point on the dc load line should be \_\_\_\_\_  
 A) stable                      B) unstable                      C) bistable                      D) all the above. (04 Marks)
- b. Draw input and output characteristics of a transistors in common emitter configuration and explain in detail. (04 Marks)
- c. Obtain the relationship between  $\alpha_{dc}$  and  $\beta_{dc}$ . (08 Marks)
- d. Calculate the values of  $I_c$ ,  $I_E$  and  $\beta_{dc}$  for a transistor with  $\alpha_{dc} = 0.98$  and  $I_B = 120\mu A$ . (04 Marks)
- 3 a. Choose the correct answers for the following :
- The reverse saturation current doubles for every \_\_\_\_\_  $^{\circ}C$  rise in temperature.  
 A) 40                      B) 45                      C) 10                      D) 50.
  - The stability factor "S" as the rate of change of collector current with \_\_\_\_\_  
 A) Base current                      B) Reverse saturation current  
 C) Emitter current                      D)  $V_{cc}$ .
  - For an emitter follower, the voltage gain is \_\_\_\_\_  
 A) unity                      B) greater than unity                      C) less than unity                      D) zero.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and/or equations written eg.  $42+8=50$ , will be treated as malpractice.

- iv) In the fixed bias circuit, the stabilization of the Q-point is \_\_\_\_\_.
- A) very poor      B) very high      C) better      D) very good.      (04 Marks)
- b. Explain the circuit operation and analysis of voltage divider bias.      (08 Marks)
- c. In the circuit shown in Fig. Q3(c), a NPN transistor with  $\beta = 100$  is used. Find  $I_B$ ,  $I_C$  and  $V_{CE}$ . Draw the dc load line and indicate the Q-point. Take  $V_{BE} = 0.7$  volts.      (08 Marks)

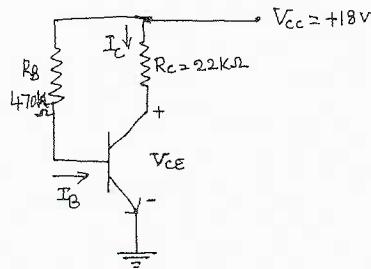


Fig. Q3(c)

- 4 a. Choose the correct answers for the following :
- i) An SCR has \_\_\_\_\_ number of p-n junctions
- A) One      B) Two      C) Three      D) Four
- ii) FET is a \_\_\_\_\_ controlled device.
- A) Voltage      B) Current      C) Power      D) None of these.
- iii) The holding current of an SCR is \_\_\_\_\_ the latching current.
- A) More than      B) Less than      C) Equal to      D) none of these
- iv) A relaxation uses
- A) MOSFET      B) SCR      C) UJT      D) BJT.      (04 Marks)
- b. Draw and explain the V-I characteristic of SCR.      (08 Marks)
- c. Explain the basic construction and equivalent circuit of UJT.      (08 Marks)

**PART - B**

- 5 a. Choose the correct answers for the following :
- i) Bandwidth of an amplifier is given by \_\_\_\_\_
- A)  $BW = f_L - f_H$       B)  $BW = f_H - f_L$       C)  $BW = f_L + f_H$       D)  $BW = 2f_L - f_H$
- ii) An amplifier is RC phase shift oscillator contributes \_\_\_\_\_ phase shift.
- A)  $180^\circ$       B)  $0^\circ$       C)  $90^\circ$       D)  $60^\circ$ .
- iii) The crystal oscillator finds use, when the \_\_\_\_\_ stability is required.
- A) Amplitude      B) Frequency      C) Phase      D) None of these.
- iv) In an oscillator, we use \_\_\_\_\_ feedback.
- A) Positive      B) Negative      C) Unity gain      D) None of these.      (04 Marks)
- b. Draw a neat circuit diagram of Hartley's oscillator and explain its working. What is the frequency of oscillations?      (08 Marks)
- c. With a neat circuit diagram and frequency response, explain the operation of single stage RC coupled amplifier.      (08 Marks)
- 6 a. Choose the correct answers for the following :
- i) An audio amplifier works over the frequency range \_\_\_\_\_.
- A) 20Hz to 20KHz      B) 20Hz to 1MHz      C) 1KHz to 4KHz      D) None of these.
- ii) Op-amp is basically a \_\_\_\_\_ amplifier.
- A) Power      B) Differential      C) Optical      D) Current.
- iii) In inverting amplifier there is \_\_\_\_\_ phase shift between input and output.
- A)  $0^\circ$       B)  $90^\circ$       C)  $180^\circ$       D)  $360^\circ$
- iv) The maximum rate at which amplifier output can change in volts per microseconds ( $V/\mu s$ ) is called \_\_\_\_\_.
- A) over rate      B) slew rate      C) under rate      D) None of these.      (04 Marks)



- b. List the characteristics of an ideal op.amp. (06 Marks)
- c. Show with a circuit diagram, how the op-amp can be used as an integrator. (05 Marks)
- d. Find the O/pP voltage of the 3 i/p adder circuit shown below Fig. Q6(d). (05 Marks)

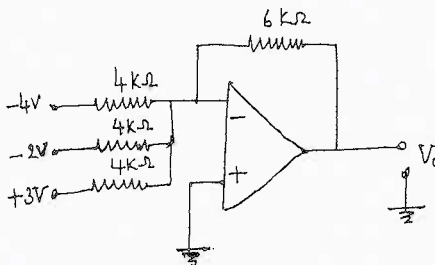


Fig. Q6(d)

- 7 a. Choose the correct answers for the following :
- The radio communication uses \_\_\_\_\_ as communication medium.  
A) Optical fibre      B) Free space      C) conducting wire      D) None of these.
  - The circuit that recovers the original modulating information from an AM signal is known as  
A) Modulator      B) Mixer      C) Demodulator      D) Oscillator.
  - 2's complement of binary number 10110 as  
A) 00011      B) 01010      C) 11100      D) 11111.
  - $(28)_{10} = ( )_2$   
A) 11100      B) 01110      C) 11000      D) 00011. (04 Marks)
- b. Explain the need for modulation. (04 Marks)
- c. Draw the block diagram of a super heterodyne receiver and explain the function of each block. (06 Marks)
- d. Perform the following :
- Convert  $(725.25)_8 = ( )_{10} = ( )_2$
  - Subtract using 2's complement  $(4 - 9)_{10}$
  - $(11010.101)_2 = ( )_8 = ( )_{16}$ . (06 Marks)
- 8 a. Choose the correct answers for the following :
- Universal gates are \_\_\_\_\_ and \_\_\_\_\_.  
A) NOT and NOR      B) AND or OR      C) NAND and NOR      D) EX-OR and EX-NOR.
  - $(A+B)(B+C) =$  \_\_\_\_\_  
A)  $B + \bar{A}C$       B)  $B + \bar{B}C$       C)  $B + AC$       D)  $AB$ .
  - The output is high, when all the inputs are low, such a gate is called \_\_\_\_\_.  
A) NAND      B) AND      C) OR      D) EX-OR
  - Full adder has \_\_\_\_\_ inputs.  
A) 1      B) 2      C) 3      D) 4. (04 Marks)
- b. State and prove De Morgan's theorem. (04 Marks)
- c. Simplify
- $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + AB\bar{C}$ , realize using basic gates.
  - $(A + \bar{B} + C)(\bar{A} + B + C)$ , realize using two input NAND gates. (08 Marks)
- d. Realize a full adder using 2 Half adder and OR gate. (04 Marks)

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**First/Second Semester B.E Degree Examination, June /July 2017**

**Environmental Studies**

**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 50

**INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the fifty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

- 
1. The Earth is surrounded by a blanket of air which is referred to as  
 a) Atmosphere                      b) Biosphere                      c) Hydrosphere                      d) Lithosphere
  2. The term Biosphere was coined by scientist from  
 a) Romania                      b) Russia                      c) Spain                      d) Sweden
  3. The mantle supporting lithosphere is known as  
 a) Asthenosphere                      b) Mantle                      c) Magma                      d) Lava
  4. The by – product in Autotrophs is  
 a) Carbon                      b) Oxygen                      c) Nitrogen                      d) Hydrogen
  5. Fungi and Bacteria are  
 a) Producers                      b) Hyterotrophs                      c) Consumers                      d) Decomposers
  6. Transpiration by plants is affected by  
 a) Temperature                      b) Pressure                      c) Humidity                      d) Gravity
  7. The process leading to soil depletion in situ is known as  
 a) Soil degradation                      b) Soil erosion                      c) Urbanization                      d) None

8. Aggregation of clay into sand – sized grains is by  
a) Vegetation                      b) Wild fire                      c) Conservation                      d) Overgrazing
9. Removal of trees cause  
a) Loss of biodiversity    b) Ecological impact    c) Soil erosion                      d) All of these
10. Consumption of fossil fuels result in  
a) Ozone depletion                      b) Global warming                      c) both                      d) None of the above
11. Marine Iguanas were killed due to oil spill at  
a) Santa Fe                      b) Andaman                      c) Nicobar                      d) Lakshadweep
12. Arsenic , Fluorides , Phosphates emit from  
a) Dairy plants                      b) Distillery unit                      c) Fertilizer plant                      d) Tanneries
13. Mercaptanes is a gaseous effluent characteristic of  
a) Tanneries                      b) Chemical industry    c) Petrochemicals                      d) All of these
14. As per IS : 10500 2003, maximum limit of turbidity is  
a) 5 NTU                      b) 10 NTU                      c) 15 NTU                      d) 20 NTU
15. Typhoid is a disease due to presence of  
a) Bacteria                      b) Fungus                      c) Virus                      d) All
16. Water borne diseases include  
a) Polio                      b) Meningitis                      c) Cholera                      d) All
17. Raw sewage used as fertilizer resulted in cholera at  
a) Palestine                      b) Peru                      c) Paraguay                      d) Panama
18. Methaemoglobinemia is a syndrome due to excess of  
a) Nitrates                      b) Phosphates                      c) Chlorides                      d) Sulphates
19. Limestone reefs are built up by  
a) Corals                      b) Algae                      c) Both                      d) None of these
20. Coal is a dirty fuel because it emits  
a) CO<sub>2</sub>                      b) SO<sub>2</sub>                      c) NO<sub>2</sub>                      d) All
21. Wet gas contains low amounts of  
a) Propane                      b) Pentane                      c) Methane                      d) Hexane
22. Chemical added to detect any leakage of LPG is  
a) Trihydrothiophe                      b) Trinitrothiophene  
c) Tritrohythiophene                      d) Tritronitrothiophene
23. Huge radioactive fallout on life across Europe is due to nuclear disaster at  
a) Cambodia                      b) Cameroon                      c) Chernobyl                      d) Cape Town

24. Nuclear power plant in Karnataka is Situated in  
a) Karwar                      b) Kaiga                      c) Kudremukh                      d) None
25. Tidal energy schemes in India is being experimented in  
a) Mumbai                      b) Kerala                      c) Tamilnadu                      d) Orissa
26. Coal mines result in enhancing hardness of water due to emission of  
a) Sulphuric acid                      b) Nitric acid                      c) Phosphoric acid                      d) All
27. Accelerated Algae and water plant growth is  
a) Putrefaction                      b) Eutrophication                      c) Denitrification                      d) None
28. Silting is encouraged due to photosynthesis of  
a) Algae                      b) Bacteria                      c) Corals                      d) Planktons
29. The word soil is derived from  
a) English                      b) French                      c) Latin                      d) Italian
30. Source of soil pollution is due to  
a) Mining                      b) Biological agents                      c) Urban wastes                      d) All of these
31. Common viruses present in sewage are  
a) Adeno viruses                      b) Anterioviruses                      c) Glutoviruses                      d) All of these
32. Process in which MSW is decomposed is known as  
a) Sanitary landfill                      b) Composting                      c) Incineration                      d) None
33. Progress of a nation depends on  
a) Population density                      b) Literacy rates                      c) Family size                      d) All of these
34. Country not belonging to G7 is  
a) Canada                      b) Britain                      c) Cambodia                      d) Germany
35. Population growth is not the cause of poverty according to  
a) Karl Marx                      b) Napoleon                      c) Nelson Mandela                      d) Lincoln
36. Key remedy for fast population growth happens to be  
a) Prosperity                      b) Nutrition                      c) Social security                      d) All these
37. Major Green House Gas is  
a) CO<sub>2</sub>                      b) CH<sub>4</sub>                      c) CFC                      d) O<sub>3</sub>
38. Kyoto protocol was opened for signature on  
a) February 16, 1998                      b) March 16, 1998                      c) April 16, 1998                      d) May 16, 1998
39. 'Acid Rain' was coined by  
a) Albert Rogers                      b) Albert Agnus                      c) Robert Angus                      d) Alfred Rogers
40. Acid rain can be  
a) Dry                      b) Wet                      c) Both                      d) None of these

41. Lowest  $P^H$  recorded in rainwater is  
a) 1.5                      b) 2.5                      c) 3.5                      d) 4.5
42. Primary cause of acid rain is due to presence of  
a)  $SO_2$                       b)  $CO_2$                       c)  $NO_2$                       d)  $P_2O_5$
43. Invaluable stone statues are partially dissolved by acid rain in  
a) Sweden                      b) Greece                      c) Ukraine                      d) Uganda
44. Acid rain has become an invisible threat particularly in  
a) Turkey                      b) Tuvalu                      c) Japan                      d) Jordan
45. U.N. conference on Human Environment held in  
a) Manchester                      b) Glasgow                      c) Stockholm                      d) Liverpool
46. Air Act extends to  
a) North India                      b) South Central India  
c) Whole of India                      d) Includes Pakistan
47. Water Act in the first instance applies to  
a) Tamilnadu                      b) Andhra Pradesh                      c) Karnataka                      d) Maharashtra
48. Wild Life Act extends in India except  
a) Karnataka                      b) Kerala                      c) Kashmir                      d) Assam
49. On 29<sup>th</sup> April 1999, NGO's are signified by UN  
a) President                      b) Secretary General                      c) Chief                      d) All
50. Guiding principles for Environmental Education were formulated at conference held in  
a) New York                      b) Tbilisi                      c) Los Angeles                      d) Brimingham

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# CBCS Scheme

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Question Paper Version : B

**First/Second Semester B.E Degree Examination, June / July 2017**

## **Environmental Studies**

**(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 40

### **INSTRUCTIONS TO THE CANDIDATES**

1. Answer all the forty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. Which of the following is considered as an alternate fuel?  
 a) CNG                      b) Kerosine                      c) Coal                      d) Petrol
2. Wind Farms are located in,  
 a) River basin              b) Plain area                      c) Hilly area                      d) Valley area
3. Hydrogen energy can be tapped through,  
 a) Heat pumps              b) Fuel cells                      c) Photovoltaic cell              d) Gasifier
4. With Minimum resource maximum energy can be created by,  
 a) Solar radiation              b) Wind                      c) Nuclear fuels                      d) Tidal waves
5. Nuclear fusion uses the following as a fuel,  
 a) Carbon                      b) Helium                      c) Hydrogen                      d) Water
6. Biogas is gaseous fuel composed mainly of,  
 a) Methane and carbon dioxide                      b) Methane and hydrogen sulphide  
 c) Methane and Carbon monoxide                      d) None of these



7. Reduction in brightness of the famous Taj Mahal is due to,  
 a) Global warming    b) Air pollution    c) Ozone depletion    d) Afforestation
8. Ozone layer thickness is measured in,  
 a) PPM    b) PPB    c) Decibels    d) Dobson units
9. Bhopal gas tragedy caused due to leakage of,  
 a) Methyl Iso Cyanate    b) Sulphur dioxide    c) Hydrogen Sulphide    d) Methane
10. Septic tank is,  
 a) An aerobic attached growth treatment system  
 b) An aerobic suspended growth biological treatment system  
 c) An aerobic attached growth biological treatment system.  
 d) An aerobic suspended growth treatment system.
11. Sound that is safest to the human ear should not exceed,  
 a) 45 Db    b) 125 Db    c) 70 Db    d) 85 Db
12. Scientific means of M.S.W management involves,  
 a) Collection and transport    b) Segregation  
 c) Safe disposal    d) All of these
13. Cow dung can be used,  
 a) as manure    b) for production of Bio gas  
 c) as fuel    d) All of these
14. Biomedical waste can be disposed off by,  
 a) Incineration    b) Autoclaving and Land filling  
 c) Both (a) and (b)    d) None of these
15. The objectives of Integrated Child Development Services (ICDS) are,  
 a) Immunization    b) Health check up and referral services.  
 c) Pre-school non-formal education    d) All of these
16. The international protocol to protect the ozone layer is,  
 a) Montreal protocol    b) The Vienna protocol  
 c) Kyoto protocol    d) Cartagena protocol
17. Environmental (protection) act was enacted in the year,  
 a) 1986    b) 1992    c) 1984    d) 1974
18. The forest (conservation) act was enacted in the year,  
 a) 1986    b) 1974    c) 1994    d) 1972
19. The leader of Chipko movement is,  
 a) Sunderlal Bahuguna    b) Medha Patkar    c) Vandana Shiva    d) Suresh Hebliker

20. Chernobyl Nuclear disaster occurred in the year,  
a) 1984                                      b) 1985                                      c) 1986                                      d) 1987
21. The computer driven system that permits storing and retrieving environmental information,  
a) GIS                                      b) Digital information                                      c) Information technology                                      d) None of these
22. Bacteria that are commonly associated with root nodules are,  
a) Rhizobium                                      b) Bacillus                                      c) Pseudomonas                                      d) None of these
23. Earth's fresh water reserves are about,  
a) 2.6%                                      b) 26%                                      c) 0.26%                                      d) 1.6%
24. The Earth is believed to have come to existence some,  
a) 3.5 billion years ago                                      b) 4.5 billion years ago  
c) 4.5 million years ago                                      d) 5.5 million years ago
25. The term environment has been derived from French word which means to encircle or surround.  
a) Environ                                      b) Oikor                                      c) Geo                                      d) Aqua
26. Which of the following component of the environment are effective transport of matter?  
a) Atmosphere and hydrosphere                                      b) Atmosphere and Lithosphere  
c) Hydrosphere and Lithosphere                                      d) Lithosphere and hydrosphere.
27. Which of the following is a biotic component of an ecosystem:  
a) Fungi                                      b) Solar light                                      c) Temperature                                      d) Humidity
28. The sequence of eating and being eaten in an ecosystem is called,  
a) Food chain                                      b) Carbon cycle                                      c) Hydrological cycle                                      d) None of these
29. Primary consumer is,  
a) Herbivores                                      b) Carnivores                                      c) Macro consumer                                      d) Omni vores
30. The Major atmospheric gas layer in stratosphere is,  
a) Hydrogen                                      b) Carbon dioxide                                      c) Ozone                                      d) Oxygen
31. A food web consists of,  
a) a portion of a food chain                                      b) an organisms position in a food chain  
c) Interlocking of food chain                                      d) a set of similar consumer
32. India has a world's largest share of which of the following:  
a) Manganese                                      b) Mica                                      c) Copper                                      d) Diamond
33. Major purpose of most of the dams around the world is,  
a) Power generation                                      b) Irrigation                                      c) Drinking water supply                                      d) Flood control
34. The Permissible range of pH for drinking water as per the Indian standard,  
a) 6 to 9                                      b) 6.5 to 7.5                                      c) 6 to 8.5                                      d) 6.5 to 8.5

35. Excess of fluorides in drinking water is likely to cause,  
a) Blue babies                      b) Fluorosis                      c) Taste and Odour                      d) Colour
36. The largest reservoir of nitrogen on our planet is,  
a) Ocean                      b) Atmosphere                      c) Biosphere                      d) Fossil fuels
37. Mining means,  
a) Conserve and Preserve minerals                      b) Check pollution due to mineral resource  
c) Extract minerals and ores                      d) None of these
38. E.I.A can be expanded as,  
a) Environment and Industrila act                      b) Environmental Impact activity  
c) Environmental Impact Assessment                      d) Environmentally important activity.
39. "Earth Day" is held every year on,  
a) June 5<sup>th</sup>                      b) November 23<sup>rd</sup>                      c) April 22<sup>nd</sup>                      d) May 16
40. Water logging is a phenomena in which,  
a) Crop patterns are rotated                      b) Soil root zone becomes saturated due to over irrigation,  
c) Erosion of soil                      d) None of these

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**First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Engineering Chemistry**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting ONE full question from each module.**

**Module-1**

1. a. Define ion selective electrode. Explain the principle and construction of glass electrode. (05 Marks)  
 b. Describe the construction and working of Ni-metal hydride battery. Write its application. (05 Marks)  
 c. Define concentration cell. The spontaneous cell  $\text{Sn}|\text{Sn}^{2+} (0.024 \text{ M})||\text{Sn}^{2+} (0.064)|\text{Sn}$  at  $25^\circ\text{C}$ . Calculate the emf of the cell and cell reactions. (05 Marks)  
 d. Explain the following battery characteristics: (05 Marks)
  - i) Voltage.
  - ii) Energy efficiency.
  - iii) Cycle life
  
2. a. Derive Nernst's equation for single electrode potential. (05 Marks)  
 b. Define fuel cell. Explain the construction and working of Lithium  $\text{MnO}_2$  cell. Write its application. (05 Marks)  
 c. What are secondary reference electrodes? Explain the construction and working of Calomel Electrode. (05 Marks)  
 d. Explain the construction and working of Methanol Oxygen fuel cell. (05 Marks)

**Module-2**

3. a. Explain the following corrosion types: (05 Marks)
  - i) Differential metal corrosion,
  - ii) Differential aeration corrosion.
- b. Define electroplating. Write technological importance of metal finishing. (05 Marks)
- c. What is anodic metal coating? Explain the process of Galvanizing. (05 Marks)
- d. Describe the electroplating of chromium. (05 Marks)
  
4. a. Explain the electrochemical theory of rusting of iron. (05 Marks)  
 b. Discuss the electroless plating of copper with reactions. (05 Marks)  
 c. Explain the factors affecting the rate of corrosion: (05 Marks)
  - i) Nature of corrosion product
  - ii) pH
- d. Discuss the following principles of metal finishing: (05 Marks)
  - i) Decomposition potential
  - ii) Over voltage.

**Module-3**

5. a. Define calorific value of a fuel. Explain the calorific value of solid fuel by determination by bomb calorimeter. (05 Marks)  
 b. Define photovoltaic cell. Explain construction and working of PV cell. (05 Marks)  
 c. Explain the synthesis of petrol by Fischer-Tropsch process. (05 Marks)  
 d. Explain the purification of Silicon by zone refining process. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Define cracking. Explain the process of fluidized bed catalytic process cracking with neat diagram. (05 Marks)  
b. Discuss the production of solar grade Silicon by Union Carbide process. (05 Marks)  
c. Write a short note on power alcohol and knocking in petrol engine. (05 Marks)  
d. Define doping. Write two physical and two chemical properties of silicon. (05 Marks)

#### Module-4

- 7 a. Define polymer. Explain the addition and condensations polymerization with examples. (05 Marks)  
b. Discuss the synthesis and application of Silicon rubber and polyurethane. (05 Marks)  
c. Explain any two structures and property of relations of polymers. (05 Marks)  
d. Write the mechanism of conduction in polyaniline. (05 Marks)
- 8 a. Explain free radical mechanism of addition polymerization by taking Vinyl Chloride as an example. (05 Marks)  
b. Explain the synthesis and applications of (i) plexi-glass, (ii) Teflon. (05 Marks)  
c. Discuss the factors influencing the  $T_g$ :  
i) Flexibility  
ii) Branching and cross linking. (05 Marks)  
d. What are conducting polymers? Write synthesis properties of Carbon fibres. (05 Marks)

#### Module-5

- 9 a. How scales and sludges are formed in boilers and write its disadvantages. (05 Marks)  
b. What are nanoscale materials? Explain synthesis of nanomaterials by chemical vapour condensation method. (05 Marks)  
c. What is desalination of water? Explain the desalination of sea water by reverse osmosis. (05 Marks)  
d. Write a note on size dependent properties of nanomaterials. (05 Marks)
- 10 a. Write a note on secondary sewage treatment method. (05 Marks)  
b. Write an account on carbon nanotubes. (05 Marks)  
c. Define fullerenes. Explain hydrothermal synthesis of nanomaterials. (05 Marks)  
d.  $25 \text{ cm}^3$  of an effluent sample requires for oxidation of  $8 \text{ cm}^3$  of  $0.001 \text{ M K}_2\text{Cr}_2\text{O}_7$ . Calculate the COD of the effluent sample. (05 Marks)

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# CBCS Scheme

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15CHE12/22

## First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

**Note:** Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Describe the construction and working of Li-MnO<sub>2</sub> battery. (05 Marks)
- b. Define battery. Explain the following battery characteristics:
- (i) Electricity storage density.
  - (ii) Energy efficiency.
  - (iii) Cycle life.
  - (iv) Shelf life. (05 Marks)
- c. Define reference electrode. Explain the construction and working of Calomel electrode. (06 Marks)

OR

- 2 a. A concentration cell was constructed by immersing two silver electrodes in 0.02 M and 2 M AgNO<sub>3</sub> solution. Write the cell representation, cell reactions and calculate the EMF of the cell at 25°C. (05 Marks)
- b. Derive Nernst equation for single electrode potential. (05 Marks)
- c. Explain the construction and working of methanol oxygen fuel cell. Mention its application. (06 Marks)

### Module-2

- 3 a. What is cathodic protection? Explain how a metal article is protected by sacrificial anodic method. (05 Marks)
- b. Explain the following factors affecting the rate of corrosion:
- (i) Nature of the metal.
  - (ii) Ratio of anodic to cathodic areas.
  - (iii) pH. (05 Marks)
- c. Explain electroless plating of copper with relevant reaction. (06 Marks)

OR

- 4 a. What is metal finishing? Give the technological importance of metal finishing. (05 Marks)
- b. Explain the influence of the following factors on the nature of electrodeposit:
- (i) pH.
  - (ii) Temperature.
  - (iii) Concentration of the metal ion. (05 Marks)
- c. Explain stress and differential metal corrosion with example. (06 Marks)

### Module-3

- 5 a. Define cracking. Describe fluidized bed catalytic cracking. (05 Marks)
- b. What is biodiesel? Explain the synthesis and advantages of biodiesel. (05 Marks)
- c. Explain the production of solar grade silicon by union-carbide process. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



OR

- 6 a. Define photo voltaic cell. Explain the construction and working of photo voltaic cell. (06 Marks)
- b. Explain the purification of silicon by zone refining. (04 Marks)
- c. A 0.6 g of coal sample (carbon 90%, H<sub>2</sub> 3% and ash 7%) was subjected to combustion in a bomb calorimeter. Mass of water taken in the calorimeter was 2000 g and the water equivalent of calorimeter was 400 g. The rise in temperature was 3°C. Calculate the gross and net calorific value of the sample. Given, specific heat of water is 4.187 KJ/kg/°C and latent heat of steam is 2454 KJ/kg. (06 Marks)

Module-4

- 7 a. Explain the free radical mechanism for addition polymerization by taking vinyl chloride as an example. (06 Marks)
- b. Explain the synthesis, properties and applications of epoxy resin. (04 Marks)
- c. What is glass transition temperature? Explain the following factors affecting glass transition temperature.  
(i) Chain flexibility and  
(ii) Intermolecular forces. (06 Marks)

OR

- 8 a. Explain structure – property relationship of polymers with respect to,  
(i) Crystallinity (ii) Tensile strength (05 Marks)
- b. What is polymerization? Explain addition and condensation polymerization with example. (05 Marks)
- c. What are polymer composite? Explain the synthesis, properties and application of Kevlar fibre. (06 Marks)

Module-5

- 9 a. Write a note on fullerenes. Mention its application. (05 Marks)
- b. Discuss the synthesis of nanomaterials by gas condensation method and chemical vapour condensation processes. (05 Marks)
- c. Discuss the experimental determination of Dissolved Oxygen (DO) of waste water. Mention the reactions involved in it. (06 Marks)

OR

- 10 a. What is desalination? Discuss the desalination of sea water by ion exchange process. (05 Marks)
- b. What is boiler feed water? Explain the scale and sludge formation in boilers. (05 Marks)
- c. Explain any three size dependent properties of nanomaterials. (06 Marks)

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**First/Second Semester B.E. Degree Examination, June/July 2016**  
**Computer Concepts and 'C' Programming**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions, choosing at least two from each part.**  
**2. Use of steam tables is not permitted.**

**PART - A**

- 1 a. Choose the correct answers for the following : (04 Marks)
- Which of the following is not a type of computer based on individual usage? (04 Marks)
    - Desktop computer
    - Workstation
    - Digital computer
    - Smart phone
  - Note book computer is also called as \_\_\_\_\_
    - PDA's
    - Laptops
    - Smart phones
    - Tablet computer
  - Display system in table computer can be rotated by \_\_\_\_\_
    - 60°
    - 120°
    - 90°
    - 180°
  - One Terabyte = \_\_\_\_\_
    - 1024 GB
    - 1024 MB
    - 1024 KB
    - 1024 bytes
- b. Explain briefly the basic structure of a computer along with a block diagram. (06 Marks)
- c. Explain the different types of audiovisual input devices. (10 Marks)
- 2 a. Choose the correct answers for the following : (04 Marks)
- The capacity of a floppy disk is \_\_\_\_\_
    - 2.44 MB
    - 1.44 MB
    - 2.48 MB
    - 2.48 MB
  - Which of the following is an example of system software?
    - MS - WORD
    - Microsoft excel
    - Text editor
    - Payroll
  - In star topology the central computer is called
    - Host
    - Source
    - Hub
    - None
  - 1 byte = \_\_\_\_\_ Nibbles.
    - 4
    - 2
    - 8
    - 1
- b. Explain how the data is organized in magnetic disk. (04 Marks)
- c. What is Operating system? Explain the types of operating system. (08 Marks)
- d. Mention the need for networking. (04 Marks)
- 3 a. Choose the correct answers for the following : (04 Marks)
- Which of the following command is used to save the program?
    - F3
    - Cntrl + V
    - F2
    - Cntrl
  - Which of the following is a newline character?
    - \t
    - \f
    - \b
    - \n
  - \_\_\_\_\_ format specifier converts the data into floating point value.
    - %e
    - %o
    - %d
    - %u
  - Which input function accept the string as input from the keyboard?
    - getchar ( )
    - gets ( )
    - getch ( )
    - getche ( )
- b. Explain the basic data types available in C language. (08 Marks)
- c. Explain the formatted Input and Output function with example. (08 Marks)
- 4 a. Choose the correct answers for the following : (04 Marks)
- Which of the following operator is R → L associativity.
    - <
    - +
    - ^
    - =

- ii) What is the output of the following statement `printf("%d\n", 12,345, 678)?`  
 A) 12                      B) 12                      C) 12,345                      D) 12,345, 678
- iii) An expression with only one operand but not any operator is called \_\_\_\_\_  
 A) Primary                      B) Ternary                      C) unary                      D) Binary
- iv) If  $i = 3$ ,  $j = 4$ , what is the value of  $j + 1 / i - 1$ .  
 A) 2                      B) 1                      C) 4                      D) 3
- b. Simplify the expression  $a += b * = C -= 5$ , where  $a = 1$ ,  $b = 3$ ,  $c = 7$ . (04 Marks)
- c. Write a C program to find the area of a triangle given the 3 sides. (06 Marks)
- d. Explain the increment and decrement operator with program. (06 Marks)

### PART - B

- 5 a. Choose the correct answers for the following : (04 Marks)
- i) Which of the following header file is used if we use `floor()` function :  
 A) `stdio.h`                      B) `conio.h`                      C) `math.h`                      D) `stdlib.h`
- ii) Which element of user defined function is not terminated by semicolon (;) :  
 A) function prototype                      B) function definition  
 C) function call                      D) function declaration
- iii) Pass by value is also called as \_\_\_\_\_  
 A) call by value                      B) call by reference  
 C) function call                      D) function declaration
- iv) \_\_\_\_\_ type of variable is accessible through out the program  
 A) local variable                      B) global variable  
 C) static variable                      D) register variable
- b. Explain briefly the different methods of passing parameter. (10 Marks)
- c. Write a C program to compute cube of a given number using functions. (06 Marks)
- 6 a. Choose the correct answers for the following : (04 Marks)
- i) The complement of `<` is \_\_\_\_\_  
 A) `>=`                      B) `<=`                      C) `>`                      D) `==`
- ii) What is the output of the following program segment
- ```
#include<stdio.h>
Void main ( )
{
  int i = 10 ;
  while (0)
  {
    Printf("%d", i) ;
  }
}
```
- A) 0 B) 10
 C) No output D) 0 is displayed ∞ times
- iii) Which of the following is valid :
 A) Case 4 : B) Case "4" : C) Case $i + 2$: D) Case 'choice' :
- iv) Which of the following loop is used when we do not know exactly how many times a set of statements have to be repeatedly executed.
 A) for B) while C) do while D) switch
- b. Write a C program to find the roots of quadratic equation. (08 Marks)
- c. Differentiate between while and do while loop with example. (08 Marks)

- 7 a. Choose the correct answers for the following : (04 Marks)
- i) Array always starts from index _____
A) 1 B) -1 C) 0 D) 2
 - ii) Linear search is also called as _____
A) Binary search B) Sequential search
C) Traversal D) Sort
 - iii) The string "\0" occupies _____ bytes
A) 2 byte B) 1 byte C) 4 byte D) 8 byte
 - iv) In a variable length string, string always ends with a delimiter
A) POS B) POS - 1 C) NULL D) NULL + 1
- b. Explain briefly the declaration and initialization of one dimensional array. (08 Marks)
- c. Write a C program to count vowels and constants in a given string. (08 Marks)
- 8 a. Choose the correct answers for the following : (04 Marks)
- i) SET 1 stands for
A) Search for extra terrestrial intelligence
B) Search for extra topology intelligence
C) Search for extraordinary terrestrial intelligence
D) Search for extra typical intelligence
 - ii) The concept of sharing of memory by various threads in program is called _____
A) sharing memory B) shared memory
C) sequential memory D) sorting memory
 - iii) Which of the following directive is not used during synchronization of tasks
A) barrier directive B) include directive
C) ordered directive D) flush directive
 - iv) Which of the function returns non zero value if dynamic adjustment is enable
A) void Omp – get – dynamic (int dynamic _ thread)
B) int Omp – get – dynamic ()
C) void Omp – get – nested (int nested)
D) int Omp – get – nested ()
- b. What is Thread? Explain the logical memory model of a thread. (10 Marks)
- c. What are the various motivating factors of Parallel programs? (06 Marks)

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First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Programming in 'C' and Data Structures

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
ONE full question from each module.*

Module-1

- 1 a. List all the restrictions on the variable names. (06 Marks)
- b. Explain the block structure of a 'C' program. (08 Marks)
- c. What are the basic data types available in 'C'? Write the significance of each data type. (06 Marks)

- 2 a. What is an assignment statement? Give the general form of an assignment statement. (05 Marks)
- b. Explain with example, the various constants available in 'C' program. (05 Marks)
- c. List and explain any five operators used in 'C' programming language. (10 Marks)

Module-2

- 3 a. Explain with example, the meaning of statement and block in a 'C' program. (05 Marks)
- b. Explain with a syntax, the different loops used in 'C' program. (09 Marks)
- c. Write a program in 'C' to find the sum of 'n' natural number without using any loops. (06 Marks)

- 4 a. Explain with example, the need of 'break' statement in a 'C' program. (05 Marks)
- b. Write a 'C' program to demonstrate the use of unconditional goto statement. (06 Marks)
- c. Explain with syntax, if, if-else and nested if-else statements in 'C' program. (09 Marks)

Module-3

- 5 a. What is the purpose of an array? Explain how two dimensional arrays is declared and initialized. (06 Marks)
- b. Explain with example :
 - i) Character string
 - ii) String literal. (06 Marks)
- c. Write a program in 'C' using functions to swap two numbers. (08 Marks)

- 6 a. Explain with syntax and example, the different types of string manipulation functions. (10 Marks)
- b. Explain with example, the general form of puts and gets function. (04 Marks)
- c. What are the three possibilities of defining a user defined functions in 'C'? (06 Marks)

Module-4

- 7 a. What is a structure data type? Give the general form of a structure declaration. (05 Marks)
- b. Explain the syntax of fprintf and fscanf functions in 'C'. (05 Marks)
- c. Using the structure data type, write a program in 'C' to read a student record from the keyboard and store it in a file called student.dot. (10 Marks)

- 8 a. Explain the differences between arrays and structures. (05 Marks)
b. What is a file? Explain fopen() and fclose() functions in 'C' language. (06 Marks)
c. Write a program in 'C' using structure to read USN, name and marks in 3 subjects for each student and store it in a file called studmarks.dat. (09 Marks)

Module-5

- 9 a. Write a 'C' program to define macros for logical operators. (08 Marks)
b. Explain the following :
i) preprocessor directive
ii) malloc() function
iii) # include directive. (06 Marks)
c. Explain the need of dynamic memory allocation. (06 Marks)
- 10 a. Explain with example # define directive. (04 Marks)
b. What is a stack? What are the operations we can carry out on a stack? (08 Marks)
c. Write a program in 'C' to create a simple linked list. (08 Marks)

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CBCS Scheme

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15PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define an Algorithm. Write an algorithm to find the area and perimeter of a rectangle. (06 Marks)
- b. Write a General structure of C. Explain with an example. (06 Marks)
- c. Convert the following mathematical expression into C equivalent:
- i) $\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
- ii) $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$ (04 Marks)

OR

- 2 a. Explain different types of input output functions in C with syntax and examples. (06 Marks)
- b. Explain the following operators :
- i) Unary
- ii) Bitwise
- iii) Conditional. (06 Marks)
- c. Draw the flowchart and write a C program to compute simple interest. (04 Marks)

Module-2

- 3 a. List all the conditional control statements used in C. Explain any two with syntax and example. (06 Marks)
- b. Write a C program that reads from the user an arithmetic operator and two operands perform the corresponding arithmetic operation on the operands using switch statement. (06 Marks)
- c. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not. (04 Marks)

OR

- 4 a. What are unconditional control statements? Explain any two with example. (06 Marks)
- b. List the types of looping statements in C. Explain any two with syntax and example. (06 Marks)
- c. Develop a C program to read a year as an input and find whether it is Leap year or not. (04 Marks)

Module-3

- 5 a. What is Array? Explain the declaration and initialization of one dimensional and two dimensional Array with example. (06 Marks)
- b. Explain any four string manipulation library function with example. (04 Marks)
- c. Write a C program to implement string copy operation STRCOPY (str1, str2) that copies a string str1 to another string str2 without using Library function. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants. (06 Marks)
- b. What is a Function? Explain the type of functions based on parameters. (06 Marks)
- c. What is Recursion? Write a C program to compute polynomial co-efficient nC_r using Recursion. (04 Marks)

Module-4

- 7 a. What is structure? Explain the C Syntax of structure declaration with example. (04 Marks)
- b. What is a FILE? Explain any five file manipulation functions with example. (06 Marks)
- c. What are actual and formal parameters? Explain various storage classes available in C. (06 Marks)

OR

- 8 a. Explain array of structure and structure within a structure with an example. (06 Marks)
- b. Write a C program to maintain a record of 'n' students details using an array of structures with four fields (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student given the student name as input. (06 Marks)
- c. Explain various modes of FILE with example. (04 Marks)

Module-5

- 9 a. What is a pointer? Explain how the pointer variable is declared and initialized. (04 Marks)
- b. What is dynamic memory allocation? Explain different dynamic memory allocation functions in C. (06 Marks)
- c. Write a C program using pointers to compute the Sum, Mean and Standard deviation of all elements stored in an array of 'n' real numbers. (06 Marks)

OR

- 10 a. Explain the Array of pointers with example. (04 Marks)
- b. Explain any two pre-processor directives in C. (04 Marks)
- c. What is Stack? Explain operations on Stack. (04 Marks)
- d. What is a Queue? Explain its applications. (04 Marks)

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CBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017 Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define the following diode parameters : (05 Marks)
 - i) Knee voltage
 - ii) Maximum forward current
 - iii) Peak inverse voltage
 - iv) Reverse breakdown voltage
 - v) Maximum power rating. (06 Marks)
- b. With neat circuit diagram and waveform explain the working of Full wave Bridge Rectifier.
- c. Draw common emitter circuit. Sketch input and output characteristics. Also explain operating regions by indicating them on characteristic curve. (05 Marks)

OR

- 2 a. Write a note on voltage regulator circuit. (05 Marks)
- b. Derive the relationship between α and β . Also calculate the α value and β value of a transistor if $I_B = 100\mu A$ and $I_C = 2mA$. (04 Marks)
- c. With a neat diagram, explain the output characteristics of a transistor in common base configuration. (07 Marks)

Module-2

- 3 a. What is DC load line? Explain with neat circuit the operation of voltage divider bias circuit. (05 Marks)
- b. What is op-amp? List the characteristics of an ideal op-amp. (06 Marks)
- c. For the circuit shown in Fig Q3(c), compute
 - i) Three transistor currents
 - ii) Voltage drop across R_C and R_B . (05 Marks)

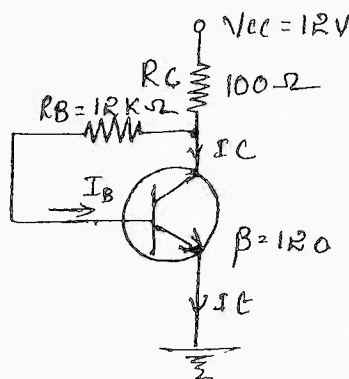


Fig Q3(b)

OR

- 4 a. Explain how op-amp can be used as
 i) An integrator ii) Differentiator iii) Voltage follower. (06 Marks)
 b. With neat circuit diagram, explain base biased method with necessary equations. (05 Marks)
 c. Find the output of the following op-amp circuit. (05 Marks)

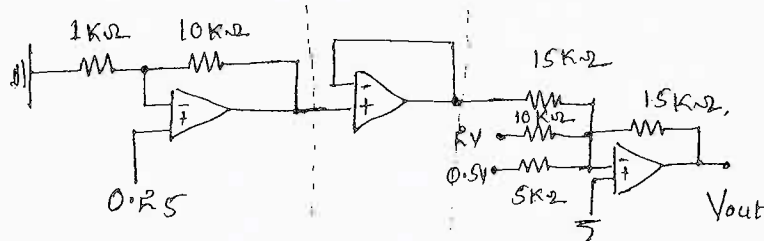


Fig Q4(c)

Module-3

- 5 a. Convert $(1101101)_2 = ()_{10}$ and $(96)_{10} = ()_2$. (04 Marks)
 b. Convert $(FA876)_{16} = ()_8$ and $(237)_8 = ()_{16}$. (04 Marks)
 c. Design Full adder circuit. (08 Marks)

OR

- 6 a. State and prove De Morgan's theorem. (05 Marks)
 b. What are Universal gates? Realize AND, OR Gates using Universal gates. (05 Marks)
 c. Subtract $(19)_{10}$ from $(15)_{10}$ using 1s and 2s complement methods. (06 Marks)

Module-4

- 7 a. Write a note on NOR gate latch. (05 Marks)
 b. Explain the working of clocked RS flip flop using NAND gates. (06 Marks)
 c. Define microcontrollers. Write their important applications. (05 Marks)

OR

- 8 a. Explain the architecture of 8051 micro controller. (08 Marks)
 b. Mention the difference between latch and Flip flop. (02 Marks)
 c. Write a note on interfacing of 8051 microcontroller with stepper motor. (06 Marks)

Module-5

- 9 a. Explain the block diagram of communication system. (05 Marks)
 b. Define Amplitude modulation. Derive mathematical expression for the same. Draw waveforms. (06 Marks)
 c. Explain the construction and the principle of operation of LVDT. (05 Marks)

OR

- 10 a. List the differences between Amplitude modulation and frequency modulation. (05 Marks)
 b. Explain frequency modulation with neat waveforms. (05 Marks)
 c. A carrier of 10V peak and frequency 100KHz is amplitude modulated by a sine wave of 4V peak and frequency 1000Hz. Determine the modulation index for the modulated wave and draw the amplitude spectrum. (06 Marks)

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First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017
Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the fifty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The study of interactions between living organisms and environment is called as,
a) Ecosystem b) Ecology c) Phytogeography d) Phytosociology
 2. The short term properties of the atmosphere at a given place and time is referred as,
a) Climate b) Microclimate c) Season d) Weather
 3. Common energy source in Indian villages is,
a) Electricity b) Coal c) Sun d) Wood and animal dung.
 4. Fossil fuels and metallic minerals are,
a) Renewable resources b) In exhaustible resources
c) Non-renewable resources d) None of these
 5. Bath power and manure is provided by,
a) Nuclear plants b) Thermal plants c) Biogas plants d) Hydroelectric plants
 6. Deforestation generally decreases,
a) Rainfall b) Soil erosion c) Drought d) Global warming
 7. Chipko movement was started to conserve,
a) Forest b) Grass land c) Deserts d) Soil

8. Terrace farming is practiced in,
 a) Coastal areas b) Deserts c) Hills d) Plains
9. Which ecological pyramid is always straight?
 a) Pyramid of biomass b) Pyramid of numbers
 c) Pyramid of energy d) Pyramid of numbers and biomass.
10. Increases in fauna and decrease in flora would be harmful due to increase in,
 a) Diseases b) CO₂ c) O₂ d) Radioactive pollution
11. Tropical forest occurs in India in,
 a) Jammu and Kashmir b) Rajasthan c) Kerala and Assam d) No where
12. If all the plants of the earth die suddenly all the animals die due to deficiency of,
 a) Food b) Shade c) Oxygen d) Shelter
13. In our country the percentage of land under forest is about,
 a) 20% b) 19% c) 25% d) 30%
14. The area reserved for the welfare of wildlife is called.
 a) National park b) Botanical garden c) Sanctuary d) Forest
15. Acid rain is caused by increase in the atmospheric concentration of.
 a) Ozone and dust b) SO₂ and NO₂ c) SO₃ & CO d) CO₂ & CO
16. Gas leaked in Bhopal tragedy was.
 a) Potassium isothiocyanate b) Sodium isothiocyanate
 c) Ethyl isocyanate d) Methyl isocyanate
17. Ozone layer of upper atmosphere is being destroyed by,
 a) Sulphur dioxide b) Photochemical oxidants
 c) Chlorofluorocarbon d) Smog
18. Dysentery spread due to.
 a) Food adulteration b) Humid weather
 c) Water pollution d) Air pollution
19. Maximum deposition of DDT will occur in,
 a) Phytoplankton b) Crab
 c) Eel d) Sea gull
20. Disease caused by eating fish inhabiting mercury contaminated water is,
 a) Bright's disease b) Minimata diseases
 c) Hashimoto disease d) Osteosclerosis
21. Fluoride pollution mainly affects.
 a) Kidney b) Brain c) Heart d) Teeth

22. Which of the following is not a greenhouse gas?
a) Oxygen b) CO₂ c) Chlorofluorocarbons d) Methane
23. Study of trends in human population growth and prediction of future growth is called.
a) Demography b) Biography c) Kalography d) Psychology
24. The number of babies produced per thousand individuals is called,
a) Natality b) Mortality c) Immigration d) Emigration
25. A pesticide/insecticide which has reported to cause physical deformities and disease in infants in Karnataka and Kerala state recently is,
a) Endosulfan b) DDT c) Amitraz d) None of these
26. The highest concentration of people with HIV infection have been recorded from.
a) USA b) India c) China d) Africa
27. Vasectomy is the method of sterilization in.
a) Man b) Woman c) Both Man and Woman d) None of these
28. ICDS is a welfare scheme for,
a) Public b) Women c) Men d) Children
29. The common pollutants present in ponds and pools nearby agricultural fields are,
a) Dust b) Straw c) Pollons d) Chemical fertilizer & pesticide
30. The non-green plants which obtains food from other plants are called.
a) Hosts b) Parasites c) Saprophytes d) Insectivorous plants
31. The liquid wastes from bathroom and kitchens are called,
a) Sullage b) Domestic sewage c) Storm water d) Runoff
32. EIA is abbreviated form for,
a) Energy impact assessment b) Ecological impact assessment
c) Environmental impact assessment d) Emission impact assessment
33. The fossil fuel which cause maximum environmental pollution due to its use in generation of thermal power is,
a) Coal b) Oil c) Natural gas d) None of these
34. Most stable ecosystem is,
a) Forest b) Desert c) Ocean d) Mountains
35. What is the pH range of drinking water.
a) 6 to 9 b) 6.5 to 8.5 c) 6 to 8.5 d) 6.5 to 7.5
36. Biogas is mostly made of,
a) Hydrogen b) Carbon dioxide c) ethane d) Methane

37. Which of the following is not a natural disaster:
 a) Cyclone b) Nuclear explosion c) Earthquake d) Volcane
38. Which state is having highest women illiteracy rate in India?
 a) Karnataka b) Punjab c) Rajasthan d) Kerala
39. The percentage of water accounted by oceans and seas is.
 a) 90% b) 87% c) 97% d) 99%
40. Which of the is not a biodegradable pollutant?
 a) Plastic b) Skins of vegetables and fruits c) Dry leaves d) Paper
41. The concept of BOD comprises of _____ ?
 a) Biochemical oxygen demand b) Usually less than C.O.D
 c) A measure of the organic matter present in waste water d) All of these
42. Environmental (protection) act was enacted in the year,
 a) 1986 b) 1992 c) 1984 d) 1974
43. Which of the following devices is most suitable for removal of gaseous pollutant?
 a) Cyclonic separator b) Fabric filter
 c) Electrostatic precipitator d) Wet collector
44. ISO14000 standard deals with,
 a) Pollution management b) Risk management
 c) Environmental management d) None of these
45. Sound becomes hazardous when noise pollution at _____ decibels.
 a) above 30 b) above 80 c) above 100 d) above 120
46. A major nitrogen storage reservoir is,
 a) River b) Atmosphere c) Oceans d) Trees
47. Hydrological cycle mainly involves,
 a) Air and Water b) Sun and Water c) Animal and Water d) Mountain and Water
48. Khetri (Rajasthan) is famous for,
 a) Gold mines b) Copper mines c) Granite stone d) Marble stone
49. Cauvery water dispute is in between,
 a) India and Pakistan b) Punjab and Haryana
 c) Uttar Pradesh and Madhya Pradesh d) Karnataka and Tamilnadu
50. National park concerned with rhinoceros is,
 a) Corbett b) Ranthambore c) Kaziranga d) Valley of flower

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First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017
Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the fifty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. Increasing Industrialisation is causing much danger to man's life by

a) Polluting the environment	b) Producing more goods
c) Providing more jobs	d) Utilizing waste land
2. The most environmentally friendly method of insect control from the following is

a) Application of organophosphates	b) Application of chlorinated hydro carbons
c) Application of pyrethroids	d) Crop rotation and Intercropping.
3. What does the abbreviation 'GIS' stands for

a) Geographical Information system	b) Geological Information system
c) Geographical Interpretation system	d) Geoscience Information system
4. Which of the following is likely to be present in photochemical smog?

a) Ozone	b) Peroxyacetyl nitrates (PAN)
c) Aldehyde	d) All of these
5. Which of the following components of the environment encompass living things?

a) Atmosphere	b) Hydrosphere	c) Lithosphere	d) Biosphere
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6. Ozone depletion will cause

a) More ultraviolet radiation from the sun to reach the earth	
b) Increased in skin cancer and	
c) Weakening of human immune system	d) All of these
7. Noise is,

a) Loud sound	b) Unwanted sound
c) Constant sound	d) Sound of high frequency
8. Which of the following is not a marine pollutant?

a) Oil	b) Plastics	c) Dissolved oxygen	d) Sewage
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9. Which of the following components of the environment is responsible for the large scale recycling of matter on earth?
 a) Atmosphere b) Hydrosphere c) Lithosphere d) Biosphere
10. Deforestation includes areas where, the impact of disturbance, over utilization or changing environmental conditions affects the forest to an extent that it cannot sustain a tree cover above the _____ percent threshold.
 a) 10% b) 30% c) 60% d) 80%
11. In the developing world
 a) Male population is decreasing b) Male to female ratio is increasing
 c) Infant mortality is increasing d) Life expectancy is decreasing
12. The pollutants which are emitted directly from identifiable sources are called as
 a) Secondary pollutants b) Observable pollutants
 c) Tertiary pollutants d) Primary pollutants
13. Two of the most important atmospheric conditions affecting the dispersion of pollutants are the strength of the wind and the _____ of the air
 a) stability b) depth c) temperature d) pressure
14. The three 'R's to save the environment are
 a) Reserve, Reduce, Recycle b) Reduce, Recycle, Resuse
 c) Reserve, Reuse, Reduce d) Reuse, Reserve, Reduce
15. Organic agriculture is
 a) Ecological management practice b) Ecological production management
 c) Both (a) & (b) d) None of these
16. The transfer of "Food energy" through a chain of organisms from one trophic level to another is
 a) Energy chain b) Organisms chain c) Trophic chain d) Food chain
17. The severity of an earthquake is a measure of its seismic waves and is called as
 a) epicenter b) focus c) magnitude d) ridges
18. The incident of Bhopal gas tragedy occurred on the night of
 a) December 3rd 1984 b) December 2nd 1984
 c) December 3rd 1982 d) December 1st 1984
19. Most stable form of rock in the environment is
 a) Magma b) Igneous rock c) Metamorphic d) Sedimentary rock
20. Which of the following is not true about DDT
 a) It do not break down rapidly in the environment
 b) Is more soluble in water than in fat
 c) It is inexpensive and easy to apply d) It is capable of causing cancer
21. Amrita Devi Bishnoi sacrificed her life to the protection of
 a) Sal tree b) Pine tree c) Khajri tree d) Alpine
22. What is the primary difference between renewable resources and non renewable resources?
 a) how easily they are discovered b) the amount of the resources
 c) the length of time it takes for them to be replenished
 d) how fast they are being used up.

37. Non point sources of pollution includes all of the following except _____
 a) Wind carrying dirt and pesticides from crop lands
 b) A smoke stack from power plant
 c) Run off from stockyards
 d) Fertilizer runoff from agricultural fields.
38. Which one of the following human organ is damaged by fluoride pollution in water
 a) Teeth
 b) Kidney
 c) Brain
 d) Lungs
39. Self assimilation of nutrient from 'photons' the light packets is termed as
 a) Heterotrophy
 b) Photo autotrophy
 c) Autotrophy
 d) Chemotrophy
40. The IS code for potable water is
 a) IS : 10500
 b) IS : 10000
 c) IS : 20000
 d) IS : 2014
41. Succession of life forms that starts in water is called
 a) Hydrobionts
 b) Hydrophytes
 c) Phytoplanktons
 d) Hydrosere
42. 'Silicosis' is prevalent in the
 a) Textile industry
 b) Sugar industry
 c) Stone crushers
 d) Storage battery industries
43. The minimum DO level needed for existence of life forms in water
 a) 1 mg/L
 b) 2 mg/L
 c) 3 mg/L
 d) 4 mg/L
44. The water vapour to Ozone ratio in the healthy troposphere is
 a) 1000 : 1
 b) 1 : 1
 c) 100 : 1
 d) 1 : 1000
45. What is the minimum nutritional requirement of the secured foods?
 a) 1500 cal
 b) 2000 cal
 c) 200 cal
 d) 500 cal
46. Which of the following remote sensing technologies uses sound?
 a) Radar
 b) Sonar
 c) thermal infrared imaging
 d) colour infrared imaging
47. The mile stone marking the birth of the environmental movement was
 a) The Publication of the book silent spring by Rachel Carson in 1962
 b) Chernobyl disaster
 c) Founding of green peace
 d) 1st World war
48. The process of conversion of atmospheric nitrogen to available nitrate form is called
 a) Nitrogen synthesis
 b) Denitrification
 c) Nitrification
 d) Nitrifxing.
49. Which of the following is not a key concept that is part of our definition of GIS.
 a) GIS can be used in all areas of modern science
 b) GIS technologies include GPS and remote sensing
 c) GIS includes both computer hardware and software
 d) People are an important part of GIS.
50. The Mars orbiter Mission (MOM), informally called Mangalayaan is India's first Mars orbiter and was launched by the vehicle.
 a) ASLV (Augmented Satellite Launch Vehicle)
 b) PSLV (Polar Satellite Launch Vehicle)
 c) GSLV (Geo synchronous Launch Vehicle).
 d) Ariane - 5.

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Question Paper Version : B

First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017
Constitution of India, Professional Ethics & Human Rights
(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 40

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the forty questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. Telling truth when should not is _____.
a) honesty
b) Dharma of an engineer
c) misusing of the truth
d) business principle
 2. Integrity in engineering means _____.
a) quality of being honest and fair
b) quality of service to the customer
c) quality of self-esteem behavior
d) quality of self-aggrandizement
 3. Plagiarism means _____.
a) Use of intellectual property of others
b) Research work
c) Copying information from other sources
d) None of these
 4. Copyright is for _____.
a) 15 years after his or her death
b) 20 years after his or her death
c) 50 years after his or her death
d) 100 years after his or her death
 5. The formulae of a soft drink is an example of
a) trade secret
b) patent
c) copy right
d) trade mark
 6. When did the Human Rights Act come into effect?
a) 1951
b) 1989
c) 1993
d) 1995
 7. "Human Rights" means the rights relating to
a) life
b) liberty
c) equality
d) all of these

8. Conflict of interest may be
 a) potential b) false c) created d) imaginary
9. What kind of elections takes place to Rajya Sabha?
 a) direct elections b) indirect election
 c) by elections d) mid-term election
10. Annual statement of income and expenditure of the government is known as
 a) agenda b) catalogue c) calendar d) budget
11. The Governor of the state is responsible for his actions to
 a) The state legislative assembly b) The president
 c) The prime minister d) The chief minister
12. This is not the power of the chief minister
 a) formation of government b) control over ministers
 c) chief advisor to the governor d) control over state judiciary
13. The number of ministers including the chief minister shall not exceed _____ of the total number of MLAs.
 a) 25% b) 30% c) 15% d) 20%
14. The supreme court has the power to
 a) create high courts b) create the whole judicial system
 c) supervise and control the high court d) none of these
15. Article 243(D) and 243(T) provides for reservation of seats for SC's and ST's in _____.
 a) Lok Sabha b) Rajya Sabha
 c) Vidhan Sabha d) Panchayat Raj
16. The term backward class implies backwardness
 a) socially and educationally b) culturally
 c) economically d) none of these
17. Proclamation of emergency must be laid before _____.
 a) both the houses of the parliament b) either house of parliament
 c) before the supreme court d) none of these
18. President can impose state emergency when he receives a report from the _____.
 a) chief minister b) governor
 c) chief justice d) attorney general
19. Every citizen of the age of _____ years is eligible to vote in an election.
 a) 16 years b) 21 years c) 22 years d) 18 years
20. Election disputes can be adjudicated only by _____.
 a) high court b) criminal court
 c) civil court d) election commission
21. Which among the following were given supremacy over fundamental rights?
 a) fundamental duties b) citizenship
 c) DPSP d) none of these

- 22. What do you mean by 'minimalist approach'?
 - a) sticking on maximum acceptable standards
 - b) sticking on minimum acceptable standards
 - c) sticking on full acceptable standards
 - d) none of these

- 23. In 'good work views' focus is given on _____.
 - a) concept of skillful work
 - b) concept of legal work
 - c) concept of logical work
 - d) the concept of responsibility beyond the legal and moral and call of duty

- 24. What is one of the hindrances to the responsibility?
 - a) self-deception
 - b) self-assessment
 - c) self-realization
 - d) negligence

- 25. The underlying objective of the directive principles is to achieve _____.
 - a) police state
 - b) secular state
 - c) welfare state
 - d) none of these

- 26. 'Equal pay for equal work' is an accomplishment of _____.
 - a) right to freedom
 - b) right to religion
 - c) right to constitutional remedies
 - d) right to equality

- 27. Sexual harassment of working women is violation of
 - a) fundamental duty
 - b) directive principles of state policy
 - c) fundamental right
 - d) rule of law

- 28. State should protect every monument or place or object declared to be of _____.
 - a) state importance
 - b) national importance
 - c) international importance
 - d) local importance

- 29. In Child Labour Abolition case the supreme court has held that the children below the age of _____ cannot be employed in any hazardous industry.
 - a) 16 years
 - b) 18 years
 - c) 21 years
 - d) 14 years

- 30. Name the group, which is created for the election of the president
 - a) electoral college
 - b) elected college
 - c) electoral commission
 - d) none of these

- 31. Who is the supreme commander of the defense force of India?
 - a) Prime minister
 - b) The president
 - c) Chief justice of S.C.
 - d) Parliament

- 32. Who can allot and transfer the portfolios to the ministers?
 - a) The prime minister
 - b) The president
 - c) Parliament
 - d) Cabinet

- 33. One of the objectives of the constitution is to achieve
 - a) law and order
 - b) justice
 - c) political stability
 - d) social control

34. State is authorized to make special provision for _____.
- a) women and children
 - b) men only
 - c) men and women
 - d) none of these
35. Freedom of speech and expression means right to express one's own opinion only by _____.
- a) words by mouth
 - b) writing and printing
 - c) both (a) and (b)
 - d) none of these
36. Article 21 protects
- a) life only
 - b) liberty only
 - c) life and personal liberty
 - d) none of these
37. Telephone tapping is violation of
- a) right to freedom of speech and expression
 - b) right to life and personal liberty
 - c) right to carry on any profession
 - d) right to equality
38. Right to education is a _____.
- a) fundamental right
 - b) ordinary legal right
 - c) not a right
 - d) both (a) and (b)
39. Minorities have right to _____.
- a) establish and administer educational institutions
 - b) only to establish educational institutions
 - c) carry out profession or business
 - d) none of these
40. Mandamus means
- a) request
 - b) command
 - c) permission
 - d) all of these

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CBCS Scheme

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17CHE12

First Semester B.E. Degree Examination, Dec.2017/Jan.2018 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- What are reference electrodes? Describe the construction and working of Calomel electrode, mention the uses. (07 Marks)
 - Define Battery. Explain construction, working and uses of Ni-metal Hydride battery. (07 Marks)
 - What are fuel cells? Explain the construction and working of Methanol oxygen cell. (06 Marks)

OR

- Define single Electrode Potential? Derive Nernst equation for single electrode. (07 Marks)
 - What are concentration cells? The cell potential of Ag concentration cell, $\frac{\text{Ag}_{(s)}}{\text{AgNO}_3}(0.001\text{M})(\text{AgNO}_3(\text{XM})/\text{Ag}_{(s)})$ is 0.0659 V at 25°C. Write the cell reactions and calculate the value of X. (07 Marks)
 - Write a note on: (i) Capacity (ii) Cycle life (iii) Voltage (06 Marks)

Module-2

- Define corrosion. Explain electrochemical theory of corrosion by taking Iron as an example. (07 Marks)
 - What is Anodizing? Explain anodizing of aluminium, mention uses. (07 Marks)
 - Define Electroless plating. What are the differences between electro plating and electroless plating? (06 Marks)

OR

- What is differential aeration corrosion? Explain pitting corrosion with anode and cathode reactions. (07 Marks)
 - Define metal finishing? Explain electroplating of Nickel by Watt's bath, mention the uses. (07 Marks)
 - What is cathodic protection? Explain the sacrificial anode method and impressed current method. (06 Marks)

Module-3

- Define GCV and NCV? How calorific value of a solid/liquid fuel is determined using bomb calorimeter. (07 Marks)
 - Define octane and cetane number? What is the objective of reforming of petrol and discuss the various methods of reforming. (07 Marks)
 - What are solar cells? Describe the method of purification of silicon by zone refining. (06 Marks)

important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. A coal sample containing 92% C, 7% H₂ and 3% Ash is subjected to combustion in a bomb calorimeter. Calculate the Gross and Net calorific values. Given that mass of coal sample is 0.85×10^{-3} kg, mass of water in copper calorimeter is 2 kg, water equivalent of calorimeter is 0.75 kg, rise in temperature of water is 2.5°C, latent heat of steam is 2454 kJ/kg and specific heat of water is 4.187 kJ/kg/°C. (07 Marks)
- b. Describe the production of solar grade Si by union carbide process. (07 Marks)
- c. Explain the construction and working of a PV cell. (06 Marks)

Module-4

- 7 a. What are polymers? Illustrate the mechanism of addition polymerization by taking vinyl chloride as an example. (07 Marks)
- b. Describe the manufacture of (i) PMMA (ii) Kevlar. Mention the uses. (07 Marks)
- c. Define addition and condensation polymerization process with one example each. (06 Marks)

OR

- 8 a. Define Glass Transition Temperature. Explain any three factors affecting T_g. (07 Marks)
- b. What are Elastomers? Give the synthesis and applications of, (i) Silicone rubber (ii) Epoxy resin. (07 Marks)
- c. A polymer sample containing 50, 100 and 150 molecules having molar mass 2000 g/mol, 2500 g/mol and 3000 g/mol respectively. Calculate the number average and weight average molecular mass of polymer. (06 Marks)

Module-5

- 9 a. What is Boiler Feed Water? Explain the differences between scale and sludge formation in boiler. (07 Marks)
- b. What is desalination? Explain the desalination of sea water by electro dialysis. (07 Marks)
- c. What are nano materials? Explain the synthesis of nano material by Sol.gel method. (06 Marks)

OR

- 10 a. Define COD and BOD. In COD test 25.5 cm³ and 12.5 cm³ of 0.05 N FAS solution are required for blank and sample titration respectively. The volume of the test sample used is 26 cm³. Calculate the COD of the sample solution. (08 Marks)
- b. Describe the synthesis of nano materials by chemical vapor condensation process. (06 Marks)
- c. Write a note on CNT and Dendrimers. (06 Marks)

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14CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018
Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing
 ONE full question from each module.**

Module-1

- 1 a. What are reference electrodes? Describe the construction and working of calomel electrode. (05 Marks)
- b. What is an electrolyte concentration cell? Derive an expression for its cell potential. (05 Marks)
- c. Explain the following battery characteristics : i) Cell potential ii) Capacity iii) Electricity storage density. (06 Marks)
- d. Explain the construction and working of methanol – oxygen fuel cell with a neat sketch. (04 Marks)

OR

- 2 a. Derive Nernst equation for electrode polished. (05 Marks)
- b. How pH of a given solution is determined using glass electrode? (05 Marks)
- c. Discuss the construction, working and applications of Nickel – Metal hydride battery. (05 Marks)
- d. What are lithium ion batteries? Describe the construction and working of lithium ion battery. (05 Marks)

Module-2

- 3 a. Define corrosion. Discuss electrochemical theory of corrosion. (05 Marks)
- b. Discuss corrosion control by cathodic protection with reference to sacrificial anode method. (05 Marks)
- c. Discuss the following factors which influence the nature of electro-deposit :
 i) Current density ii) Temperature iii) pH. (06 Marks)
- d. Explain electroplating of decorative chromium. (04 Marks)

OR

- 4 a. Discuss the following factors affecting the rate of corrosion :
 i) Nature of corrosion product ii) ratio of anodic to cathodic area iii) polarization of anodic and cathodic regions. (06 Marks)
- b. Write a note on Tinning. (04 Marks)
- c. What is metal finishing? Mention technological importance of metal finishing. (04 Marks)
- d. Explain electroless plating of copper and the manufacturing double sided PCBs with copper. (06 Marks)

Module-3

- 5 a. What is calorific value of a fuel? Discuss the determination of calorific value of a solid fuel using bomb calorimeter with neat sketch. (06 Marks)
- b. Discuss the synthesis of petrol by Fischer – Tropsch process. (04 Marks)
- c. Write a note on : i) power alcohol ii) biogas. (04 Marks)
- d. What are the advantages and disadvantages of PV cells? Explain the production of solar grade silicon by union carbide process. (06 Marks)

OR

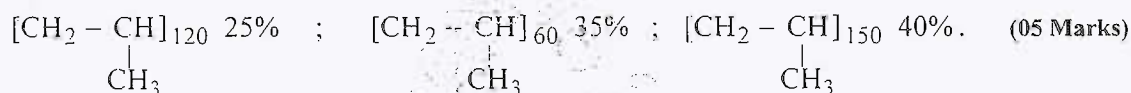
- 6 a. 0.73g of coal sample (%H = 5.0) was subjected to combustion in Bombs calorimeter. Mass of water taken in calorimeter was 1500g and water equivalent of calorimeter 470g. Initial temperature of water was 25°C and final temperature 27.3°C. Calculate GCV and NCV of coal sample. (Latent heat of steam 2454kJ/kg and specific heat of water = 4.187 kJ kg⁻¹ K⁻¹). (06 Marks)
- b. What is meant by petroleum cracking? Describe fluidized catalytic cracking process. (04 Marks)
- c. Write a note on : i) octane number ii) biodiesel. (04 Marks)
- d. What are photovoltaic cells? Explain construction and working of PV cell. (06 Marks)

Module-4

- 7 a. Define polymerization. Explain free radical mechanism for the formation of polyvinyl chloride. (06 Marks)
- b. What is glass transition temperature? Discuss any three factors that influence T_g. (04 Marks)
- c. Give the synthesis and application of : i) polyurethane and ii) polycarbonate. (05 Marks)
- d. What are conducting polymers? Explain mechanism of conduction in polyaniline. (05 Marks)

OR

- 8 a. Calculate number average and weight average molecular weight of polypropylene with following composition (Given atomic masses of C = 12, H = 1)



- b. How are structure property relationship of polymers related to crystalline and tensile strength? (05 Marks)
- c. Give the synthesis and application of : i) Silicone rubber and ii) epoxy resin. (05 Marks)
- d. What are polymer composites? Give the synthesis of carbon fiber. (05 Marks)

Module-5

- 9 a. Discuss boiler troubles with respect to scale and sludge formation. (05 Marks)
- b. Explain softening of water by ion exchange process. (05 Marks)
- c. How do you synthesize nano materials by i) precipitation method ii) chemical vapour condensation. (06 Marks)
- d. Write a note on nano wires. (04 Marks)

OR

- 10 a. Discuss boiler trouble with respect to priming and teaming. (05 Marks)
- b. What is sewage? Discuss the activated sludge process of sewage treatment. (05 Marks)
- c. How do you synthesis nano materials by i) Sol-gel process ii) gas condensation method. (06 Marks)
- d. Write a note on nano composites. (04 Marks)

CBCS Scheme

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15CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing
ONE full question from each module.

Module-1

- 1 a. What is an ion selective electrode? Explain the method of determining the pH of a solution using glass electrode. (06 Marks)
- b. Discuss the construction and working of Zinc – air battery. (05 Marks)
- c. What are fuel cells? How it is different from a galvanic cell? Mention any two advantages of fuel cells. (05 Marks)

OR

- 2 a. Describe the construction and working principle of glass electrode. (06 Marks)
- b. Explain the construction and working of Ni – metal hydride batteries. (06 Marks)
- c. What are concentration cells? The emf of the cell $\text{Cu} | \text{CuSO}_4 (0.01\text{M}) || \text{CuSO}_4(\text{XM}) | \text{Cu}$ is 0.0295V at 25°C. Find the value of X. (04 Marks)

Module-2

- 3 a. Define corrosion. Explain electrochemical theory of corrosion. (06 Marks)
- b. What is Anodization? Explain anodization of aluminium. (06 Marks)
- c. Mention the difference between electroplating and electroless plating. (04 Marks)

OR

- 4 a. Write a note on polarization and over potential. (06 Marks)
- b. What is galvanization? Describe the galvanization process for iron. (05 Marks)
- c. Explain the process of electroplating of hard chromium. (05 Marks)

Module-3

- 5 a. Define calorific value. Explain how calorific value of solid fuel is determined by bomb calorimeter. (07 Marks)
- b. Explain the synthesis of petrol by Fischer – Tropsch process. (05 Marks)
- c. Write the advantages and disadvantages of PV cells. (04 Marks)

OR

- 6 a. What is knocking in IC engines? Explain its mechanism with chemical reactions. (06 Marks)
- b. Explain the modules, panels and arrays of PV cells. (06 Marks)
- c. What is reforming of petroleum? Give any three reactions involved in reformation. (04 Marks)

Module-4

- 7 a. What are conducting polymers? Discuss the conduction mechanism in polyaniline and mention any two applications. (07 Marks)
- b. What is glass transition temperature? Explain any 3 factors influencing Tg values. (05 Marks)
- c. Explain the synthesis and applications of silicon rubber. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. A polymer has the following composition 100 molecules of molecular mass 1000g/mol, 200 molecules of molecular mass 2000g/mol and 500 molecules of molecular mass 5000g/mol. Calculate the number and weight average molecular weight. (06 Marks)
- b. Explain the synthesis and applications of : i) PMMA and ii) Epoxy resin. (06 Marks)
- c. Distinguish between addition and condensation polymerization with example. (04 Marks)

Module-5

- 9 a. Define COD. Discuss the experimental determination of COD of waste water. (06 Marks)
- b. Define desalination. Explain desalination of sea water by electro dialysis process. (06 Marks)
- c. Write a note on carbon nano tubes. Mention its applications. (04 Marks)

OR

- 10 a. Discuss the boiler corrosion due to O_2 , CO_2 and $MgCl_2$ and its control. (07 Marks)
- b. Explain the synthesis of nano materials by sol-gel process. (05 Marks)
- c. Write a note on priming and foaming. (04 Marks)

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First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018
Basic Electronics

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting ONE full question from each module.

Module – 1

1. a. Explain the operation of a full wave rectifier using centre tap transformer with the help of a circuit diagram and relevant waveforms. Show that its maximum efficiency is 81.2%. (10 Marks)
- b. Draw the common emitter circuit of a transistor and sketch the input and output characteristics. Explain the different regions of operation by indicating them on the characteristic curve. (07 Marks)
- c. Calculate I_C , I_E and β in a common emitter transistor circuit that has $\alpha = 0.98$ and $I_B = 100 \mu A$. (03 Marks)
2. a. With appropriate circuit diagram, explain the DC load line analysis of a semiconductor diode. (05 Marks)
- b. Explain the working of a negative clamper circuit. (05 Marks)
- c. A transformer with 10 : 1 turns ratio is connected to a halfwave rectifier with supply voltage of $220\sin 210t$. If load and forward resistances are 500Ω and 10Ω respectively, calculate the average output voltage, dc output power, ac input power, rectification efficiency and peak inverse voltage. (05 Marks)
- d. With neat circuit diagrams, explain zener voltage regulator with load and no load. (05 Marks)

Module – 2

3. a. In a voltage divider bias circuit, $V_{CC} = 24V$, $R_1 = 180 K\Omega$, $R_2 = 56 K\Omega$, $R_E = 4.7 K\Omega$ and $R_C = 8.2 K\Omega$. Calculate the approximate levels of I_C , V_E , V_C and V_{CE} . (05 Marks)
- b. Explain how an opamp can be used as a, (i) Voltage follower, (ii) Integrator (iii) Differentiator and (iv) Summing amplifier. (10 Marks)
- c. Design an inverting and non inverting operational amplifier to have a gain of 15. (05 Marks)
4. a. What is an operational amplifier? List the ideal characteristics of an opamp. (06 Marks)
- b. The base bias circuit has $R_B = 470 K\Omega$, $R_C = 2.2 K\Omega$, $V_{CC} = 18 V$ and if the transistor has $\beta = 100$. Determine I_B , I_C and V_{CE} . (06 Marks)
- c. Design an adder circuit using an opamp to obtain an output voltage of $V_o = -[2V_1 + 3V_2 + 5V_3]$ (05 Marks)
- d. Explain slew rate and CMRR of an opamp. (03 Marks)

Module – 3

5. a. Realize a two input exclusive NOR gate using only NAND gates, indicating the output at each of the gate. (04 Marks)
- b. Realize a Full adder using two half adders and an OR gate. Write the truth table and expressions for sum and carry outputs. (08 Marks)
- c. State and prove DeMorgan's theorem. (04 Marks)
- d. Simplify the Boolean expression, $\overline{xy + xyz + x(y + xy)}$. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Subtract $(1111.101)_2$ from $(1001.101)_2$ using 1's and 2's complement method. (04 Marks)
- b. Convert (i) $(2AD.E3)_{16}$ to its octal and decimal equivalents.
(ii) $(1456.72)_8$ to its decimal and Hexadecimal equivalents. (04 Marks)
- c. Explain the 'OR' and 'AND' operation using diodes. (06 Marks)
- d. Simplify and realize the expression using Basic gates.
 $Y = \overline{AB} + \overline{AC} + \overline{ABC} + (\overline{AB} + C)$ (06 Marks)

Module – 4

- 7 a. What is a flip flop? With the help of a logic diagram and truth table, explain the working of a clocked SR flip flop. (06 Marks)
- b. What is a transducer? Explain the working of LVDT. (05 Marks)
- c. What is a microprocessor? With a neat block diagram, explain the architecture of 8085 microprocessor. (09 Marks)
- 8 a. What is a Latch? With the help of a logic diagram and truth table, explain the working of a NAND gate latch. (06 Marks)
- b. List the differences between microprocessors and microcontrollers. (04 Marks)
- c. Write a short note on:
(i) Resistance thermometer and
(ii) Thermistor. (10 Marks)

Module – 5

- 9 a. What are the commonly used frequency ranges in communication systems? Mention the applications of each range. (04 Marks)
- b. Define amplitude modulation. Draw the AM signal and its spectrum. For an amplitude modulated wave, prove that total power is given by, $P_t = P_c \left[1 + \frac{\mu^2}{2} \right]$, where μ is the modulation index. (06 Marks)
- c. What is ISDN? Explain the services of ISDN. (05 Marks)
- d. With a neat block diagram, explain the optical fibre communication system. (05 Marks)
- 10 a. With a block diagram, explain typical cellular mobile radio unit. (05 Marks)
- b. What are the advantages of optical fibre communication? (05 Marks)
- c. Compare AM and FM modulation schemes. (04 Marks)
- d. An audio signal frequency signal $5 \sin 2\pi(1000)t$ is used to amplitude modulate a carrier of $100 \sin 2\pi(10^6)t$. Assume modulation index of 0.4. Find
(i) Sideband frequencies.
(ii) Band width required.
(iii) Amplitude of each side band
(iv) Total power delivered to a load of 100Ω (06 Marks)

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CBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018

Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the V-I characteristics of p-n junction diode. (05 Marks)
- b. The input voltage applied to the primary of a 4:1 step down transformer of a full wave centre tap rectifier is 230 V, 50 Hz is the load resistance is 600Ω and forward resistance is 20Ω . Determine the following for circuit shown in Fig.Q1(b).
- dc power output
 - Rectification efficiency
 - PIV

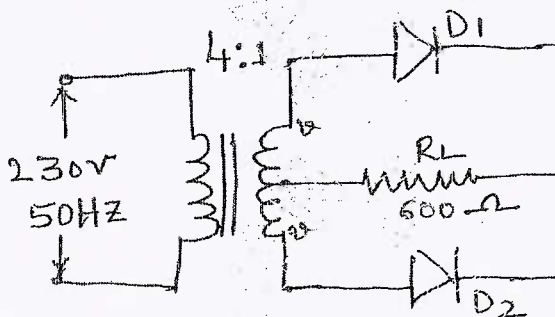


Fig.Q1(b)

- c. Explain CB configuration of BJT with characteristics. (06 Marks)

(05 Marks)

OR

- 2 a. Derive an expression for ripple factor and output dc voltage of a full wave rectifier. (06 Marks)
- b. Explain how a zener diode can be used as a voltage regulator. (05 Marks)
- c. Obtain the relationship between α and β . Calculate the value of I_C , I_E for a transistor that has $\alpha = 0.98$ and $I_B = 100 \mu A$. (05 Marks)

Module-2

- 3 a. What is DC load line? Explain collector to base biased method with necessary equation. (05 Marks)
- b. Define the following terms with respect to op-amp: (i) Slew rate, (ii) CMRR, (iii) PSRR. (05 Marks)
- c. Design an op-amp circuit that will produce an output equal to $-(4V_1 + V_2 + 0.1V_3)$. (06 Marks)

OR

- 4 a. With circuit diagram, explain the operation of voltage divider bias circuit with necessary equations. (06 Marks)
- b. Derive the expression of 3-i/p summing amplifier. (05 Marks)
- c. Draw the circuit of inverting op-amp. Derive the expression for the voltage gain. (05 Marks)

Module-3

- 5 a. Perform the following:
- Convert $(725.25)_{10} = (?)_{10} = (?)_2$
 - Subtract using 2's complement $(4 - 9)_{10}$
 - $(11010.101)_2 = (?)_8 = (?)_{16}$ (06 Marks)
- b. State and prove Demorgan's theorem. (05 Marks)
- c. Simplify the expression and realize using basic gates $\overline{A}B\overline{C} + \overline{A}B\overline{C} + A\overline{B}\overline{C} + A\overline{B}\overline{C}$. (05 Marks)

OR

- 6 a. Convert:
- $(172.625)_{10} = (?)_{16} = (?)_2$
 - $(BDCE)_{16} = (?)_2 = (?)_8$
 - $(10111101.0110)_2 = (\infty)_{10} = (?)_{16}$ (06 Marks)
- b. Simplify and realize the Boolean expression using two inputs NAND gates only $(A + \overline{B} + C)(\overline{A} + B + C)$. (05 Marks)
- c. Realize the full adder circuit for sum and carry using basic gates, explain the same with truth table. (05 Marks)

Module-4

- 7 a. Explain the operation of NAND and NOR latch with symbol, circuit and truth tube. (08 Marks)
- b. With neat block diagram, describe the architecture of 8051 microcontroller. (08 Marks)

OR

- 8 a. What is flip-flop? Explain clocked R-S flip-flop with diagram and truth table. (08 Marks)
- b. Explain the working principle of microcontroller based stepper motor control system. (08 Marks)

Module-5

- 9 a. What are the basic elements of communication system? Explain with neat block diagram. (06 Marks)
- b. Distinguish between Amplitude Modulation (AM) and Frequency Modulation (FM). (04 Marks)
- c. Explain the construction and the principle of operation of LVDT. (06 Marks)

OR

- 10 a. With relevant waveforms, explain amplitude modulation. (06 Marks)
- b. What is a transducer? Mention four important parameters of an electrical transducer. (04 Marks)
- c. Write short notes on:
- Piezo electric transducer
 - Photo electric transducer. (06 Marks)

CBCS Scheme

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17ELN15

First Semester B.E. Degree Examination, Dec.2017/Jan.2018

Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the operation of PN junction diode under forward and reverse biased conditions, with the help of VI characteristics curve. (06 Marks)
- b. Derive the relation between α and β . Calculate I_C and I_E for transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100 \mu A$. (06 Marks)
- c. With a neat circuit diagram and waveforms, explain the working of centre-tap full wave rectifier and derive the efficiency for the same. (08 Marks)

OR

- 2 a. With a neat diagram, explain the operation of PNP and NPN transistor. (08 Marks)
- b. A half wave rectifier from a supply $230 V$ 50 Hz with step down transformer ratio 3:1 to a resistive load of $10 K\Omega$. The diode forward resistance is 75Ω and transformer secondary is 10Ω . Calculate the DC current, DC voltage, efficiency and ripple factor. (06 Marks)
- c. With neat circuit diagram, explain the common emitter circuit and sketch the input and output characteristics. (06 Marks)

Module-2

- 3 a. With a necessary equation and circuit, explain the base-bias transistor circuits. (06 Marks)
- b. Design an Adder using op-amp to give the output voltage,
 $V_o = -[2V_1 + 3V_2 + 5V_3]$ (06 Marks)
- c. Derive the equations for output voltage for an inverting amplifier and an integrator. (08 Marks)

OR

- 4 a. Explain the characteristics of an ideal op-amp. Mention the applications. (06 Marks)
- b. Accurately analyze the voltage divider bias which has $V_{CC} = 18 V$, $R_1 = 33 K\Omega$, $R_2 = 12 K\Omega$ and $R_E = 1 K\Omega$. Determine V_E , V_C , V_{CE} , I_C and Q point. when transistor $h_{fe} = 200$. (08 Marks)
- c. Write short notes on op-amp virtual ground concept. (06 Marks)

Module-3

- 5 a. Perform the following:
 - i) Convert $(57345)_{10} = (\quad)_{16}$
 - ii) Subtract $(28)_{10} - (19)_{10}$ using 2's complement method. (06 Marks)
- b. Realize $Y = AB + CD + E$ using NAND gate. (06 Marks)
- c. Explain the full adder circuit with truth table. Realize the circuit for sum and carry using logic gates. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Perform the following:
- Convert $(FA27D)_{16} = ()_2 \rightarrow = ()_8 = ()_{10}$
 - Subtract $10.0101 - 101.1110$ using 1's complement method. (06 Marks)
- b. $Y = A + \bar{A}B + ABC$ simplify and implement using logic gates and NOR gates. (06 Marks)
- c. State and prove De Morgan's theorem using two variable. (08 Marks)

Module-4

- 7 a. Bring out differences between flip flops and latches. (04 Marks)
- b. Explain SR flipflop with circuit diagram and truth table. (06 Marks)
- c. With a neat block diagram explain the architecture of 8051 microcontroller. (10 Marks)

OR

- 8 a. Explain the operation of NAND gate latch with circuit and truth table. (10 Marks)
- b. What is stepper motor? With a neat block diagram, explain the working principle of microcontroller based stepper motor control system. (10 Marks)

Module-5

- 9 a. Define communication. With neat block diagram, explain the elements of communication system. (06 Marks)
- b. Derive an expression for amplitude modulation and draw the necessary waveforms. (08 Marks)
- c. What is transducer? Compare the active and passive transducers. (06 Marks)

OR

- 10 a. Bring out the difference between amplitude modulation and frequency modulation. (06 Marks)
- b. If a FM wave represented by the equation $V = 10\sin(8 \times 10^8 + 4\sin 1000t)$, calculate:
- Carrier frequency
 - Modulating frequency
 - Modulation index
 - Band width
- (06 Marks)
- c. With necessary diagram and equations, explain the following:
- Piezo-electric transducer
 - LVDT. (08 Marks)

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CBCS Scheme

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17PCD13

First Semester B.E. Degree Examination, Dec.2017/Jan.2018

Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. List all the logical operators and write a C program to demonstrate working of these logical operators. (10 Marks)
- b. Explain structure of C program with an example. (05 Marks)
- c. Classify the following as valid and invalid variable. If invalid give reasons. (05 Marks)
 - i) r143
 - ii) help+me
 - iii) auto
 - iv) hello_how
 - v) *a

OR

- 2 a. What is a token? What are different types of tokens available in c language? Explain. (10 Marks)
- b. Write an algorithm and program to find biggest of three numbers. (10 Marks)

Module-2

- 3 a. Write a C program to find the roots of quadratic equation. (10 Marks)
- b. Explain syntax of while statement. Write a C program to check the given number is palindrome or not. (10 Marks)

OR

- 4 a. Explain break and continue statements with respect to do-while, while and for loop with suitable examples. (10 Marks)
- b. Print the following series: (05 Marks)

```
1
1 2
1 2 3
1 2 3 4
```
- c. Explain ternary operator with suitable example. (05 Marks)

Module-3

- 5 a. Define an array. Write a syntax for declaring two dimensional array and initialize the same with suitable example. (10 Marks)
- b. Write a C program to find sum of array elements by passing array as function argument. (05 Marks)
- c. Explain any two string manipulation functions. (05 Marks)

OR

- 6 a. Explain recursion with an example. (06 Marks)
- b. Write a C program to sort the elements of a given array using bubble sort. (08 Marks)
- c. Write a C program to concatenate two strings without using built-in function strcat(). (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50. will be treated as malpractice.

Module-4

- 7 a. What is structure? Explain its declaration and initialization with an example. (06 Marks)
b. Explain any four file operations with an example. (06 Marks)
c. Write a C program to pass structure variable as function argument. (08 Marks)

OR

- 8 a. Write a C program to store and print Name, USN, SubjectName and IA Marks of student using structure. (10 Marks)
b. Explain typedef with suitable example. (05 Marks)
c. Explain how the input is accepted from file and displayed. (05 Marks)

Module-5

- 9 a. What is pointer? Give advantages and disadvantages of pointers in C. (07 Marks)
b. Explain malloc() and calloc() functions with examples. (06 Marks)
c. What is queue? Explain its operations. (07 Marks)

OR

- 10 a. Write a C program to swap two numbers using call by address. (08 Marks)
b. What are primitive and non-primitive data types and explain. (07 Marks)
c. Define stack. List applications of stack. (05 Marks)

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CBCS Scheme

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15PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018

Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is a variable? Explain the rules for constructing variables in C language. Give examples for valid and invalid variables. (06 Marks)
- b. Write C expressions corresponding to the following (Assume all quantities are of same type):
- i) $A = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$ ii) $B = e^{x^2 - 20}$ iii) $C = \frac{x}{b+c} + \frac{y}{b-c}$
- iv) $D = \sqrt{2\pi n}$ v) $E = \sin \theta$ vi) $F = \sin\left(\frac{b}{\sqrt{a^2 + b^2}}\right)$ (06 Marks)
- c. Write a C program to find area of a circle. (04 Marks)

OR

- 2 a. List all the operators supported in C. Explain relational, logical and bitwise operators. (08 Marks)
- b. Write a C program to find area of a triangle, when we know the lengths of all three of its sides. (08 Marks)

Module-2

- 3 a. List all the conditional control statements used in C. Explain if...else and nested if statements with example for each. (08 Marks)
- b. Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. Error message should be displayed, if any attempt is made to divide by zero. (08 Marks)

OR

- 4 a. Explain the different types of loops used in C with syntax and example for each. (08 Marks)
- b. Write a C program to find the sum of series $1 + x + x^2 + x^3 + \dots + x^n$. (08 Marks)

Module-3

- 5 a. What is an array? Explain different methods of initialization of single dimensional array. (08 Marks)
- b. Write a C program to sort the given array elements in ascending order by using bubble sort. (08 Marks)

OR

- 6 a. Write a C program to compute the factorial of a given number 'n' using recursion. (08 Marks)
- b. Explain any four string manipulation library functions with example. (08 Marks)

Module-4

- 7 a. Write a C program to input the following details of 'N' students using structure:
Roll No: integer, Name : string, Marks : float, Grade : Char
Print the names of the students with marks ≥ 70.0 . (08 Marks)
- b. Explain the following file operations along with syntax:
i) fopen() ii) fclose() iii) fscanf() iv) fprintf() (08 Marks)

OR

- 8 a. Write a C program to maintain a record of 'n' employee detail using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above Rs.10,000. (08 Marks)
- b. Explain structure within a structure with an example. (08 Marks)

Module-5

- 9 a. Define a pointer. Explain with an example, the declaration and initialization of a pointer variable. (06 Marks)
- b. Develop a C program to read two numbers and function to swap these numbers using pointers. (06 Marks)
- c. Explain the following C functions along with syntax: i) malloc() ii) calloc() (04 Marks)

OR

- 10 a. Explain stack and queue data structures along with their applications. (08 Marks)
- b. Explain any four preprocessor directives in C language with example for each. (08 Marks)

CBCS Scheme

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Question Paper Version : D

First Semester B.E. Degree Examination, Dec.2017/Jan.2018

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the fifty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. India has the largest share of which of the following
a) Manganese b) Mica c) Copper d) Diamond
 2. Forests prevent soil erosion by binding soil particles in their
a) Stems b) Roots c) Leaves d) Buds
 3. Which of the following is the most environmental friendly agriculture practice
a) using chemical fertilizers b) using insecticides
c) organic farming d) None of these
 4. Mining means
a) To conserve minerals b) To check pollution
c) To extract minerals and ores d) None of these
 5. Which of the following is absorbed by green plants from atmosphere
a) Carbon -di - oxide b) Water c) Nutrients d) All of the above
 6. Which atmospheric sphere is closest to earth surface
a) Troposphere b) Stratosphere c) Mesosphere d) Exosphere
 7. The largest reservoir of Nitrogen in our plant is
a) Oceans b) Atmosphere c) Biosphere d) Fossil fuels

8. In an Ecosystem, the flow of energy is
a) Bidirectional b) Cyclic c) Unidirectional d) Multidirectional!
9. Which of the following conceptual spheres of the environment is having the least storage capacity for matter
a) Atmosphere b) Lithosphere c) Hydrosphere d) Biosphere
10. The term Environment has been derived from the French word _____ which means to encircle or surround.
a) Environ b) Oikos c) Geo d) Aqua
11. Remote sensing technique deals with the detection of recording of a selected portion of
a) Emission spectrum b) Light spectrum
c) Photo spectrum d) Electro magnetic spectrum
12. RADAR stands for
a) Radio & Distance Ranging b) Radio detection & Ranging
c) Ranging & Detection Arrangement d) Radio detection Recorder
13. Which is not a commonly using coding scheme for images
a) JPEG b) GIF c) MP3 d) Tiff
14. DBMS stands for
a) Database Management System b) Database Monitoring system
c) Database Manufacturing system d) Database Mixing station
15. GIS stands for
a) Geostationary interact sector b) Geographical information system
c) Geotechnical information society d) Geothermal investigation site
16. Which State is having highest women literacy rate in India
a) Karnataka b) Punjab c) Rajasthan d) Kerala
17. In water treatment, alum is used for
a) Softening b) Coagulation c) Filtration d) Disinfection
18. World Ozone day is being celebrated on
a) September 5th b) October 15th c) September 11th d) September 16th
19. Acid rain has been increasing day by day due to
a) Urbanisation b) Industrialization
c) Increase in vehicle population d) None of these
20. Reduction in brightness of the famous Taj Mahal is due to
a) Global warming b) Air pollution c) Ozone depletion d) Afforestation
21. Primary cause of Acid rain around the World is due to
a) Carbon-di-oxide b) Sulphur-di-oxide c) Carbon-Monoxide d) Ozone

- 22. Petroleum based vehicles emit tracer of
a) CO & NO₂ b) SPM c) Aldehydes d) CH_n

- 23. Definition of Noise is
a) Loud sound b) Unwanted sound
c) Constant sound d) Sound on high frequency

- 24. Smog is
a) A natural phenomenon b) Combination of smoke & fog
c) Colourless d) All the above

- 25. The liquid waste from kitchen and bathroom is called
a) Sullage b) Domestic sewage c) Storm waste d) Run off

- 26. BOD means
a) Bio chemical oxygen demand b) Chemical oxygen demand
c) Bio – physical oxygen demand d) All the above

- 27. Highest producer of oil and petroleum is
a) Middle East countries b) America
c) China d) India

- 28. Nuclear waste is active for
a) 5 year b) 10 years c) 50 years d) Centuries

- 29. Nuclear power plant in Karnataka is located at
a) Bhadravathi b) Sondur c) Raichur d) Kaiga

- 30. Direct conversion of solar energy is attained by
a) Solar photo voltaic system b) Solar diesel hybrid system
c) Solar thermal system d) Solar air heater

CBCS SCHEME

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15CHE12/22

First/Second Semester B.E. Degree Examination, June/July 2018 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Derive Nernst's equation for single electrode potential of an electrode considering reduction reaction. (05 Marks)
- b. Define electrolyte concentration cell. Calculate the e.m.f of the given concentration cell at 298 K
 $\text{Ag} | \text{AgNO}_3 (0.02 \text{ M}) || \text{AgNO}_3 (2 \text{ M}) | \text{Ag}$ (05 Marks)
- c. Describe construction, working and application of methanol- O_2 fuel cell using H_2SO_4 as electrolyte (06 Marks)

OR

- 2 a. Define reference electrode. Describe construction and working of Calomel electrode with reactions. (05 Marks)
- b. Describe construction and working of Zn-Air battery. Mention its application. (05 Marks)
- c. Explain the following battery characteristics :
(i) Capacity (ii) Cycle life (iii) Energy-efficiency (06 Marks)

Module-2

- 3 a. Explain electrochemical theory of corrosion with its mechanism taking Iron as an example. (06 Marks)
- b. Describe the following factors which affects the rate of corrosion:
(i) Nature of corrosion product
(ii) Ratio of Anodic to cathodic area
(iii) pH of the medium. (06 Marks)
- c. Describe electroplating of Nickel by Watt's bath. Mention its applications. (04 Marks)

OR

- 4 a. Define Metal finishing. Describe the technological importance of metal finishing. (05 Marks)
- b. Describe electroless plating of copper on PCB's with plating reaction. Mention its application. (05 Marks)
- c. Explain Differential Aeration Corrosion with an example. (06 Marks)

Module-3

- 5 a. Describe Bomb calorimetric method for determination of calorific value of a fuel. (05 Marks)
- b. What do you mean by reforming of petroleum? Give any three reactions involved in reforming process. (05 Marks)
- c. Explain the production of solar grade silicon by Union carbide method. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Calculate the gross or net calorific value of a coal sample from the following data obtained from Bomb calorimetric experiment.
- (i) Weight of coal = 0.75 kg ; (ii) Weight of water taken in calorimeter = 1200 kg ;
 (iii) Water equivalent of calorimeter = 400 kg ; (iv) Rise in temperature = 1.8°C ;
 (v) Hydrogen in coal sample = 2% (vi) Latent heat of steam = 587×4.2 kJ/kg ;
 (vii) Specific heat of water = 4.187 kJ/kg/°C (06 Marks)
- b. Explain construction, working and application of photovoltaic cell. (06 Marks)
- c. Explain the purification of silicon by zone-refining technique. (04 Marks)

Module-4

- 7 a. Explain the free radical mechanism for addition polymerization taking Vinyl chloride as an example. (05 Marks)
- b. Explain the synthesis and application of the following :
- (i) Plexiglass (PMMA) (ii) Polyurethane (06 Marks)
- c. Define Glass transition temperature. Describe the following factors which affects T_g value
- (i) Flexibility of polymer chain (ii) Intermolecular force of attraction. (05 Marks)

OR

- 8 a. Calculate number average and weight average mole wt. of a polymer in which 200 molecules of 1000 mole mass and 300 molecules of 2000 mole mass and 500 molecules of 3000 mole mass are present respectively. (06 Marks)
- b. Explain the synthesis, properties and application of silicon rubber. (05 Marks)
- c. What are polymer composites? Describe the synthesis and application of Kevlar fibre. (05 Marks)

Module-5

- 9 a. Explain scale and sludge formation in the boiler. Mention its ill effects. (05 Marks)
- b. Explain the softening of water by ion-exchange resin method. (05 Marks)
- c. Describe the Sol-Gel process for synthesis of Nanomaterial. (06 Marks)

OR

- 10 a. What is desalination of water? Explain the reverse-Osmosis process for desalination of water. (05 Marks)
- b. Write short notes on Fullerene and Dendrimers. (06 Marks)
- c. Explain the synthesis of Nanomaterial by chemical vapour condensation method. (05 Marks)

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CBCS Scheme

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17CHE12/22

First/Second Semester B.E. Degree Examination, June/July 2018 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define single electrode potential. Derive Nernst equation. (07 Marks)
b. Describe the construction and working of zinc-air battery. Mention any two applications. (07 Marks)
c. Define concentration cells. The cell potential of Ag concentration cell is $\text{Ag}/\text{AgNO}_3(0.002\text{M})/(\text{AgNO}_3(\text{XM})/\text{Ag}$ is 0.0751V at 25°C. Write the cell reactions and calculate the value of X. (06 Marks)

OR

- 2 a. What are reference electrodes? How will you determine the electrode potential of unknown electrode using calomel as reference electrode? (07 Marks)
b. Explain the construction and working of Lithium ion battery. Mention its application. (07 Marks)
c. What are fuel cells? Explain the construction and working of methanol-oxygen fuel cell. (06 Marks)

Module-2

- 3 a. Define corrosion. Explain electrochemical theory of corrosion by taking iron as example. (07 Marks)
b. What is galvanizing? Explain the various steps involved in it. (07 Marks)
c. Explain electroplating of Nickel by Watts Bath and mention its uses. (06 Marks)

OR

- 4 a. Explain stress corrosion and water line. (07 Marks)
b. Explain the following: i) polarization ii) over voltage. (06 Marks)
c. What is electroless plating? Explain the electroless plating of copper. (07 Marks)

Module-3

- 5 a. A coal sample contains 5.8% H_2 is subjected to combustion in a bomb calorimeter. Calculate the gross and net calorific values. Given that mass of coal sample is 0.78×10^{-3} kg, mass of water in copper calorimeter is 2.5 kg, water equivalent of calorimeter is 0.83 kg rise in temperature is 3.2°C, latent heat of steam is 2454 kJ/kg and specific heat 4.187 kJ/kg/°C. (07 Marks)
b. Define knocking. Explain the mechanism of knocking and mention its ill effects. (07 Marks)
c. Define photovoltaic cell. Describe the construction and working of photo-voltaic cell with a neat diagram. (06 Marks)

OR

- 6 a. Define cracking. Explain fluidized catalytic cracking with a neat diagram. (07 Marks)
b. Explain the Fischer-Tropsch process of synthesis of petrol. (07 Marks)
c. Describe the method of purification of silicon by zone refining. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Distinguish between addition and condensation polymerization reactions with suitable examples. (06 Marks)
- b. Explain the mechanism of addition polymerization by taking vinyl chloride as example. (07 Marks)
- c. A polymer sample containing 100, 150 and 200 molecules having molar mass 3000 g/mol, 3500 g/mol and 4000 g/mol respectively. Calculate the number average and weight average molecular mass of the polymer. (07 Marks)

OR

- 8 a. Define T_g . Explain any three factors affecting T_g . (07 Marks)
- b. Describe the synthesis of (i) Polyurethane (ii) Silicone rubber. Mention the application. (07 Marks)
- c. What are adhesives? Explain the synthesis and application of epoxy resins. (06 Marks)

Module-5

- 9 a. What is boiler feed water? Explain priming and foaming in boilers. (06 Marks)
- b. Define COD. In a COD tests 32.7 cm³ and 23.5 cm³ of 0.02N FAS solution are required for blank and sample titration respectively. The volume of test sample is 25 cm³. Calculate the COD of solution. (07 Marks)
- c. Explain the synthesis of nanomaterial by sol-gel process. (07 Marks)

OR

- 10 a. Define BOD. Explain the determination of BOD. (07 Marks)
- b. What is desalination? Explain the desalination of seawater by electro dialysis. (07 Marks)
- c. Write a note on nano composites and fullerenes. (06 Marks)

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14PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2018
Programming in C and Data Structures

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting ONE full question from each module.

Module – 1

- 1 a. Explain basic concepts of C program. (08 Marks)
- b. Define variable. Give example. List out any four rules to be followed while using a variable. (06 Marks)
- c. Write a C program to swap the contents of two variables. (06 Marks)
- 2 a. Explain relational operators in C with example. (08 Marks)
- b. Define Pseudocode. What is its purpose? Write pseudocode to display numbers from 1 to 10 along with their squares. (06 Marks)
- c. What would be the value of 'a' after the execution of the following expressions:
 (i) $a += (a++) + (++a)$ (ii) $a = (--a) - (a--)$ (06 Marks)

Module – 2

- 3 a. Explain single selection and two way selection in C language along with syntax. (08 Marks)
- b. What is purpose of switch statement? Explain with syntax. (04 Marks)
- c. Write a C program to simulate the working of a calculator with addition, subtraction, multiplication and division. Use switch. (08 Marks)
- 4 a. How do you perform looping in C? Give the syntax of loop constructs. (08 Marks)
- b. Explain the following statements supported in C – break, continue, goto. (06 Marks)
- c. Write a C program to find the sum of individual digits of the given number. (06 Marks)

Module – 3

- 5 a. Define array. List four properties of an array. Explain declaration of single dimensional array with example. (08 Marks)
- b. Explain call by value and call by reference with example. (06 Marks)
- c. Write a program to accept a string and check whether it is palindrome or not. (06 Marks)
- 6 a. Explain function declaration, function definition and function call. (06 Marks)
- b. Explain any four string library functions with example. (08 Marks)
- c. Write a recursive program to find factorial of a number. (06 Marks)

Module – 4

- 7 a. What is a structure? Give its syntax. How to declare a structure? (06 Marks)
- b. Using structures with a C program that takes book ID, Author name, Publisher name and price for a book as input and prints the same information as output. (08 Marks)
- c. What is a text file? What are various steps to be performed when we do file manipulations? (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 8 a. Write a program to open a file in read only mode. (08 Marks)
b. Explain array of structures with example. (06 Marks)
c. What is the use of fscanf () and fprintf () function? Explain with syntax. (06 Marks)

Module – 5

- 9 a. What are preprocessor directives and symbolic constants? Write a program to show the usage of symbolic constant. (08 Marks)
b. List out any four advantages of preprocessor. (04 Marks)
c. What is dynamic memory allocation? Write and explain different dynamic memory allocation in C. (08 Marks)
- 10 a. Write a C program to compare two strings using pointers. (08 Marks)
b. Define Stack and Queue. Outline their applications. (06 Marks)
c. Explain any two preprocessor directives with example. (06 Marks)

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CBCS Scheme

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15PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2018 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is pseudocode and what is the purpose of pseudocode? (06 Marks)
- b. Explain the basic structure of a 'C' program and write a 'C' program to calculate the area of rectangle. (10 Marks)

OR

- 2 a. Which are 2 important point to declare variable? Explain with syntax. (06 Marks)
- b. What is data type and explain all different data types with syntax and examples. (10 Marks)

Module-2

- 3 a. How many decision control statements are there in 'C' language? List out all types of control statements. (04 Marks)
- b. Explain if-else control statement with syntax and flow chart. (06 Marks)
- c. Explain else-if ladder control statement with syntax and flow chart. (06 Marks)

OR

- 4 a. Explain 'for' loop control statement with syntax and flow chart. (06 Marks)
- b. What is the difference between while-do loop and do-while loop? Explain with syntax and example. (06 Marks)
- c. Write a 'C' program to find the sum of 'N' natural numbers using 'for' loop. (04 Marks)

Module-3

- 5 a. Define array. Explain how one-dimensional array is declared and initialized with syntax. (06 Marks)
- b. Write a 'C' program to read N integers (+Ve, -Ve and zero) into an array:
 - i) Find the sum of -Ve integers
 - ii) Find the sum of +Ve integers
 - iii) Find the average of all integers(10 Marks)

OR

- 6 a. Define string. List out all string manipulation functions. (06 Marks)
- b. Write a 'C' program to read 2-strings and compare both the strings with specified number of characters and with case sensitive and without case sensitive. (10 Marks)

Module-4

- 7 a. What is structure? Write a 'C' program to read name, USN from main function and print the name, USN using structure. (06 Marks)
- b. Explain type defining a structure with two different techniques and also with syntax. (06 Marks)
- c. What are different operations that can be performed on the file? Explain fscanf operation with syntax? (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Write a 'C' program to count the number of characters, number of lines and number of white spaces from a file. (10 Marks)
b. What is meant by array of structure? How it can be created? (06 Marks)

Module-5

- 9 a. What is pointer? How pointers are declared and initialized? Explain with syntax. (06 Marks)
b. Write a 'C' program to access the value of variable 'a' and 'b' through the pointer 'p' and 'q' by *p and *q respectively. (05 Marks)
c. Write a 'C' program by using single pointer 'p' is made to point variable a, b and c respectively and display the value of a, b, and c through single pointer p. (05 Marks)

OR

- 10 a. What are preprocessors directives? Explain the advantages of preprocessor directives with examples. (08 Marks)
b. Explain conditional compilation preprocessor directives with suitable program to find the area of circle, by giving the radius of circles. (08 Marks)

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CBCS SCHEME

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17PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2018 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write basic structure of C program and explain its different sections. (08 Marks)
- b. What are the rules to be followed to declare an identifier with example? (04 Marks)
- c. Write a note on different types of Type conversions, with an example/program for each. (08 Marks)

OR

- 2 a. Define C – tokens. List and explain different C – tokens. (08 Marks)
- b. Write a C program to convert number of days into months and days. (Hint : Assume a month has 30 days) (For e.g. 45 days = 1 month and 15 days). (04 Marks)
- c. Write a note on Operator precedence and Associativity. (08 Marks)

Module-2

- 3 a. An Electric power distribution company charges its domestic consumers as follows :

Consumption Units	Rate of charge
0 - 200	Rs 0.50 per units
201 - 400	Rs 100 + Rs 0.65 per unit excess of 200
401 - 600	Rs 230 + Rs 0.80 per unit excess of 400
601 - above	Rs 390 + Rs 1.00 per unit excess of 600

- Write a C program to compute and print amount to be paid by the customer. (08 Marks)
- b. Write the Syntax of different looping control constructs and explain their working. (08 Marks)
- c. Distinguish between the following :
 - i) goto and if
 - ii) break and continue. (04 Marks)

OR

- 4 a. Write the Syntax of nested if ...else statement and explain its working. (08 Marks)
- b. Write a C program to convert a decimal number to binary form. (08 Marks)
- c. Differentiate between do...while loop and while loop, with the help of Syntax. (04 Marks)

Module-3

- 5 a. Write a C program to search a key integer element in the given array of N elements using binary search technique. Print the output with suitable headings. (08 Marks)
- b. Distinguish between the following types of variables :
 - i) Automatic
 - ii) Global
 - iii) Static
 - iv) Register. (08 Marks)
- c. Explain the importance of strcmp () and strcat () string manipulation functions. (04 Marks)

OR

- 6 a. Write the Syntax and give an example for each : (08 Marks)
 - i) Declaration of One – dimensional array
 - ii) Initialization of One – dimensional array
 - iii) Declaration of Two – dimensional array
 - iv) Initialization of Two – dimensional array.

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- b. Write a C program to find n^{th} term of Fibonacci series using recursion. (08 Marks)
 c. Write a C program to find length of a string without using `strlen()` function. (04 Marks)

Module-4

- 7 a. Write a note on the following with an example for each : (08 Marks)
 i) Arrays of structures ii) Arrays within structures iii) Structures within structures.
 b. Write a C program to count the number of characters, Number of lines and number of white spaces from a file. (08 Marks)
 c. Create structure `st_record` having members student Name (Sname) and student marks (Smarks). Write a C program which reads name and marks of two students and compare whether both students are same. (04 Marks)

OR

- 8 a. Mention importance of the following input/output file operations along with Syntax and example for each : (08 Marks)
 i) `fscanf()` ii) `fprintf()` iii) `fopen()` iv) `fclose()`.
 b. Create a structure `st_record` having members to store name of student, marks scored in three different subjects. Create a user defined function `cal-average()` to compute average marks scored by the student. Write a C program which reads details of a student and prints whether a student is pass or fail. (08 Marks)
 c. Mention syntax and give an example for the following : (04 Marks)
 i) Structure definition ii) Structure variable declaration.

Module-5

- 9 a. Write Syntax and give an example of function declaration of the following : (08 Marks)
 i) `malloc()` ii) `calloc()` iii) `realloc()` iv) `free()`.
 b. Write a note on categories of pre – processor directives. (08 Marks)
 c. List two disadvantages of : i) Arrays ii) Linked lists. (04 Marks)

OR

- 10 a. Write a note on the following data structures : (08 Marks)
 i) Linked list ii) Stack.
 b. Write a C program which copies contents of a string to another using pointer as function parameter. Print copied string. (08 Marks)
 c. Mention significance of compiler control Pre – processor directives. (04 Marks)

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14ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2018
Basic Electronics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting ONE full question from each module.

Module-1

- 1 a. Draw and explain the V-I characteristics of Si and Ge diode. (06 Marks)
- b. A Zener diode with $V_Z = 4.3V$ and Z_Z equal to 22Ω when $I_Z = 20mA$. Calculate the upper and lower limits of V_Z when I_Z changes by $\pm 5 mA$. (06 Marks)
- c. Sketch the typical input and output characteristics for the CE configuration. Briefly explain the three regions of operation. (08 Marks)

OR

- 2 a. Explain the working of positive clamping. (05 Marks)
- b. A diode with $V_F = 0.7V$ is connected as a Half wave rectifier. The load resistance is 500Ω , and the (r.m.s) ac input is 22v. Determine the peak output voltage, the peak load current, and the diode peak inverse voltage. (05 Marks)
- c. Calculate I_C and I_E for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100\mu A$. Determine the value of β_{dc} (or h_{FE}) for the transistor. (04 Marks)
- d. With a circuit diagram, explain the working of a centre tapped FWR. (06 Marks)

Module-2

- 3 a. List the factors, which affect the stability of operating point. (04 Marks)
- b. For CE – circuit shown in Fig Q3 (b) draw the DC load line and obtain Q-point values. Assume $\beta = 100$ and $V_{BE} = 0.7V$.

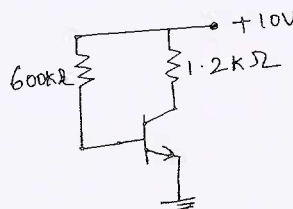


Fig Q3(b)

- c. With a neat diagram, explain how op-amp can be used as differentiator (04 Marks)
- d. For the op-amp circuit of Fig Q3(d), find the output voltage and closed loop gain.

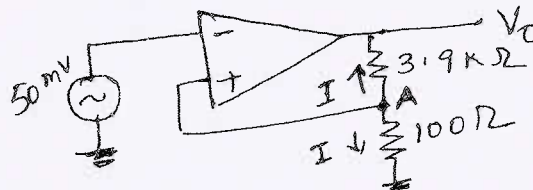


Fig Q3(d)

(04 Marks)

OR

- 4 a. With a neat circuit diagram, explain the voltage divider biasing circuit and derive the expression for V_{CE} and I_C . (08 Marks)
- b. List the characteristics of an ideal op-amp and draw the three input inverting summer circuit using an op-amp and derive an expression for output voltage. (08 Marks)

- c. Find the output of the op-amp circuit shown in Fig Q4(c) (04 Marks)

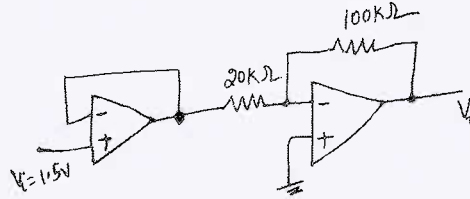


Fig Q4(c)

Module-3

- 5 a. Convert $(BCDE)_{16} = ()_2 = ()_8 = ()_{10}$. (03 Marks)
 b. Subtract $(57)_{10}$ from $(43)_{10}$ using 2's complement form. (05 Marks)
 c. Simplify the following Boolean expression
 i) $Y = \overline{ABC} + \overline{A}BC + A\overline{BC} + ABC$
 ii) $Y = (\overline{A}B + \overline{A}C)(BC + \overline{B}C)(ABC)$ (06 Marks)
 d. Draw the logic diagram of a full adder and also write its truth table with sum and carry expressions. (06 Marks)

OR

- 6 a. Design a logic diagram using basic gates with 3 inputs A, B, C and output Y that goes high only when A is high. (05 Marks)
 b. Simplify and realize the Boolean expressions, using two input NAND gates only
 i) $ABCD + \overline{A}BCD$ ii) $AB + ABC + ABC\overline{C} + \overline{A}BC$ iii) $AB + ABC + AB(D + E)$ (10 Marks)
 c. Perform the following :
 i) $(110011)_2 - (11001)_2 = (?)_2$ - using 2's compliment
 ii) $(11110101)_2 - (10010101)_2 = (?)_2$ - Using 1's complement. (05 Marks)

Module-4

- 7 a. With the help of logic diagram and truth table explain the working of the clocked RS Flip Flop. (06 Marks)
 b. List the differences between Microprocessor and Microcontroller. (05 Marks)
 c. What is Transducer? Distinguish between active and passive Transducers. (04 Marks)
 d. Explain the working of Piezoelectric Transducer. (05 Marks)

OR

- 8 a. With a neat block diagram explain architecture of 8051 microcontroller. (10 Marks)
 b. Explain the working of LVDT. (06 Marks)
 c. Explain: i) Hall effect ii) Seebeck effect. (04 Marks)

Module-5

- 9 a. Draw the block diagram of communication system and explain each element. (08 Marks)
 b. With a network diagram explain the working of typical switched telephone system. (05 Marks)
 c. Mention the advantages and applications of Optical Fibre Communications. (07 Marks)

OR

- 10 a. Define FM. Draw the FM signal. Write the expression for FM wave. (05 Marks)
 b. A 500W, 100KHz carrier is modulated to a depth of 60% by modulating signal frequency of 1KHz. Calculate the total power transmitted. What are the side band components of the AM wave? (06 Marks)
 c. Give the comparison between AM and FM. (05 Marks)
 d. Explain the principle of operations of mobile phones. (04 Marks)

CBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2018 Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the i) Ideal-diode approximation ii) Practical diode approximation
iii) Piece-wise linear approximation of diode. (06 Marks)
- b. Draw the circuit of full-wave rectifier and derive the expression for average dc current I_{DC} , RMS load current I_{RMS} . (08 Marks)
- c. Calculate the output voltage V_0 in the following circuit:

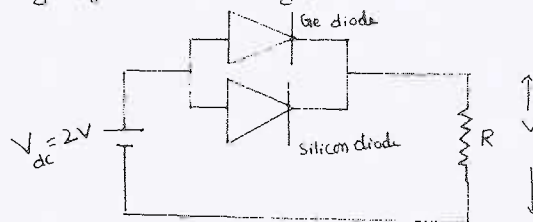


Fig.Q.1(c)

Assume V_r (breakdown V_g of Ge) = 0.7V

Assume V_r (breakdown V_g of silicon) = 0.3V.

(02 Marks)

OR

- 2 a. Draw the common Emitter circuit and sketch the output characteristics, explain active region, cut off region and saturation region by indicating them on the characteristic curve. (08 Marks)
- b. A transistor has $I_B = 100\mu A$ and $I_C = 2mA$. Find: i) β of the transistor ii) α of the transistor
iii) Emitter current I_E iv) If I_B changes by $+25\mu A$ and I_C changes by $+0.6mA$. Find the new value of β . (08 Marks)

Module-2

- 3 a. Sketch a base-bias circuit and write equations for I_B , I_C and V_{CE} . (04 Marks)
- b. A voltage divider bias circuit with a 25V supply has $R_C = 4.7 K\Omega$, $R_E = 3.3 K\Omega$, $R_1 = 33K\Omega$, $R_2 = 12K\Omega$ and $h_{FE} = 50$. Use the approximate analysis method to calculate the V_{CE} level. (08 Marks)
- c. Derive the output equation for non-inverting amplifier using op-amp. (04 Marks)

OR

- 4 a. Define the terms: i) Slew rate ii) CMRR iii) Common mode gain A_C . (06 Marks)
- b. Design an adder circuit using op-amp to obtain an output expression $V_0 = -(0.1V_1 + 0.5V_2 + 20V_3)$ where V_1 , V_2 and V_3 are the inputs select $R_f = 10K\Omega$. (06 Marks)
- c. Write any four Ideal-opamp characteristics. (04 Marks)

Module-3

- 5 a. Convert the following binary numbers to octal number system:
 i) 1011.1111 ii) 111100111110001. (04 Marks)
 b. With a neat diagram, explain the concept of digital waveform. (06 Marks)
 c. Subtract $(1000.01)_2$ from $(1011.10)_2$ using 1's and 2's complement method. (06 Marks)

OR

- 6 a. State and prove De-Morgan's theorem. (04 Marks)
 b. Simplify the following Boolean expressions:
 i) $AB + \overline{AC} + ABC(AB + C)$
 ii) $\overline{\overline{AB} + ABC + A(B + \overline{AB})}$ (06 Marks)
 c. Realize full adder circuit using NAND gate. (06 Marks)

Module-4

- 7 a. Explain the working of clocked R-S flip flop with a suitable circuit, symbol, truth-table, input-output waveforms considering positive edge triggered RS flip-flop. (08 Marks)
 b. With a neat block diagram, explain how stepper motor is interfaced to 8051 microcontroller. (08 Marks)

OR

- 8 a. With a neat diagram, explain flag register of 8051 microcontroller. (06 Marks)
 b. Differentiate between latches and flip-flops. (04 Marks)
 c. Draw the TMOD register and explain how it control the modes of operation of a timer in 8051 microcontroller. (06 Marks)

Module-5

- 9 a. Define amplitude modulation and derive the expression for standard amplitude modulation. Also define modulation index. (06 Marks)
 b. A broadcast transmitter radiates 20kW when the modulation percentage is 75. How much of this is carrier power? Also calculate the power of each sideband. (06 Marks)
 c. Distinguish between frequency modulation and amplitude modulation. (04 Marks)

OR

- 10 a. With a neat diagram, explain the construction and operation of LVDT. Also mention its advantages and disadvantages. (10 Marks)
 b. An FM signal is given as $V = 12 \sin(5 \times 10^3 t + 5 \sin 1250t)$. Calculate: i) Carrier frequency
 ii) Modulating frequency iii) Frequency deviation. (06 Marks)

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CBCS SCHEME

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17ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2018 Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the operation of p-n junction diode under forward and reverse bias condition. (08 Marks)
- b. Explain how zener diode can be used as voltage regulator. (05 Marks)
- c. With a neat diagram, explain the output characteristics of a transistor in common base configuration. (07 Marks)

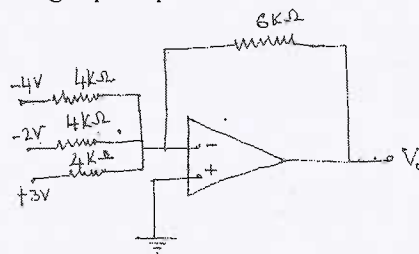
OR

- 2 a. With neat circuit diagram, explain the operation of Centre – tapped full wave rectifier. Draw input and output waveforms. (08 Marks)
- b. Explain the working principle of NPN transistor. (08 Marks)
- c. Explain the relationship between α and β . Find the values of β , α for a transistor has $I_B = 10\mu A$ and $I_C = 1mA$. (04 Marks)

Module-2

- 3 a. With neat circuit diagram, explain the operation of voltage divider bias circuit with necessary equations. (05 Marks)
- b. What is Op – amp? List the characteristics of an ideal Op-amp. (05 Marks)
- c. Find the output of the following Op-amp circuit. (05 Marks)

Fig.Q3(c)

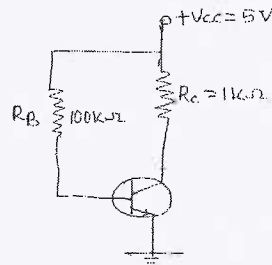


- d. Draw the circuit of Op-amp integrator. Derive the expression of output voltage. (05 Marks)

OR

- 4 a. For the circuit shown in fig.Q4(a), find the Q – point values and draw d.c load line, where $V_{BE} = 0.7V$ and $\beta = 50$. (08 Marks)

Fig.Q4(a)



- b. Define the following terms with respect to Op-amp. (05 Marks)
- c. Draw the circuit of inverting Op-amp. Derive the expression for the voltage gain. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Convert : (08 Marks)
- i) $(11001.011)_2 = ()_{10}$ iii) $(64.73)_8 = ()_{16}$
 ii) $(186.75)_{10} = ()_2$ iv) $(ABCD)_{16} = ()_2$.
- b. Subtract the following using 2's Complement method. (04 Marks)
- i) $(111001)_2 - (101011)_2$ ii) $(1111)_2 - (1011)_2$.
- c. Simplify the following expression and realize using basic gates
 $Y = ABC + AB\bar{C} + \bar{A}BC$. (04 Marks)
- d. State and prove de – Morgan's theorem using truth table for 2 variable. (04 Marks)

OR

- 6 a. Explain full adder circuit with truth table. Realize the circuit for sum and carry using basic gates. Also write the diagram showing full adder using two half adder. (10 Marks)
- b. Implement Ex - OR gate using only NAND gate. (05 Marks)
- c. Simplify and realize the following using only NAND gate.
 $Y = A\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B} + \bar{A}\bar{C}$. (05 Marks)

Module-4

- 7 a. Mention the difference between Latch and Flip flop. (05 Marks)
- b. Define Microcontroller, write important features. (05 Marks)
- c. With a neat block diagram, explain the architecture of 8051 microcontroller. (10 Marks)

OR

- 8 a. Write a note on NOR – gate latch. (04 Marks)
- b. Explain the working of clocked RS Flip flop using NAND gates. (06 Marks)
- c. Interface stepper motor to 8051 micro – controller. With a neat block diagram, explain its working principle. (10 Marks)

Module-5

- 9 a. With the help of block diagram, explain communication system. (04 Marks)
- b. Define Amplitude modulation. Derive Mathematical expression for the same. Draw waveforms. (08 Marks)
- c. Explain the construction and principle of operation of LVDT. (08 Marks)

OR

- 10 a. List the difference between AM and FM. (04 Marks)
- b. Explain Frequency modulation, with neat waveform. (08 Marks)
- c. Briefly explain the working of thermistor. Mention its applications. (08 Marks)

CBCS Scheme

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First/Second Semester B.E Degree Examination, Dec.2017/Jan.2018

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 40

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the forty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The objective of environmental education is
 - a) Raise consciousness about environmental conditions
 - b) To teach environmentally appropriate behaviour
 - c) Create an environmental ethic
 - d) All of the above.
 2. Which of the following is a biotic component of an ecosystem?
 - a) Fungi
 - b) Solar light
 - c) Temperature
 - d) humidity.
 3. In complex ecosystems the degree of species diversity is
 - a) Poor
 - b) High
 - c) Medium
 - d) None.
 4. Which of the following statement is false
 - a) Inorganic nutrients are recycled in an ecosystem
 - b) Energy "flows" through the ecosystem in the form of carbon-carbon bonds
 - c) Energy is recycled in an ecosystem
 - d) Respiration process releases energy.
 5. In an ecosystem biological cycling of materials is maintained by
 - a) Procedure
 - b) Consumer
 - c) Decomposer
 - d) All of the above.

6. A predator is
a) An animal that is fed upon
b) An animal that feeds upon another animal
c) Animal that feeds upon both plants and animals
d) A primary consumer.
7. Ozone concentration is relatively more in
a) Mesosphere b) Stratosphere c) Staticsphere d) Atmosphere.
8. World environmental day is on
a) 5th May b) 5th June c) 15th June d) 15th May.
9. EIA can be expanded as
a) Environment of Industrial Act b) Environment Important Act
c) Environment Impact Assessment d) Economic Industrial Act.
10. Major purpose of most of the dams are
a) Power generation b) Drinking c) Flood control d) Irrigation.
11. Eutrophication is related to
a) Water b) Soil c) Air d) Land.
12. Water logging is effect of modern
a) Industries b) Agriculture c) Population d) Education.
13. Bioremediation means removal of contaminates by
a) Mining b) Super bugs c) Air d) Water.
14. Nitrate contamination causes
a) White baby syndrom b) Blue baby syndrom
c) Green baby syndrom d) Black baby syndrom.
15. Out of the following nutrients in fertilizers which one causes minimum water pollution
a) Nitrogen b) Phosphorous c) Potassium d) Organic matter.
16. Fluorosis is caused due to
a) Chlorine b) Fluoride c) Feldspar d) Farming.
17. Hepatitis is caused by
a) Hepata worm b) Virus c) Amoeba d) Fungus.
18. Chernobyl disaster occurred in the year
a) 1986 b) 2006 c) 2011 d) 1947.

19. Fukushima disaster is a
a) Heavy metal disaster
b) Nuclear disaster
c) Atom bomb disaster
d) Pesticide disaster.
20. A country without a single nuclear power plant is
a) China
b) USA
c) Australia
d) France.
21. Which of the following is more ecofriendly source of producing energy
a) Biogas
b) Coal
c) Fuel cells
d) Hydel
22. Electromagnetic radiation can cause
a) Plague
b) Dengue
c) Cancer
d) Malaria.
23. Wind farms are located in
a) River basin
b) Plain areas
c) Hilly areas
d) Forest areas.
24. Natural gas contains
a) Methane
b) Oxygen
c) Nitrogen
d) Sulphur.
25. The source of electromagnetic radiation is
a) Magnetics
b) Electrons
c) Sun
d) Earth.
26. Which of the following sources is surface water
a) Springs
b) Streams
c) Wells
d) all.
27. Which of the following is an air pollutant
a) CO
b) O₂
c) N₂
d) all.
28. Smog in London was due to
a) SO₂ and NO₂
b) CO₂ and CO
c) Methane and ethane
d) Water and air.
29. Which of the following are Non-biodegradable
a) Plastics
b) Domestic sewage
c) Detergent
d) a and c
30. Endosulfan is a
a) Organization
b) Institution
c) Pesticide
d) River
31. Minamata disease is caused due to
a) Lead
b) Copper
c) Mercury
d) Arsenic.
32. World's single largest class of refugees is due to
a) War
b) Earthquake
c) Tsunami
d) Environmental degradation.

33. Noise pollution limits at airport area
a) 65dB b) 120dB c) 240dB d) 600dB.
34. Blaring sounds are known to cause
a) Metal distress b) Deafness
c) Neurological problems d) All the above.
35. Increase in asthma attacks has been linked to high levels of
a) Soil borne pesticides b) Air borne dust pesticides
c) CO₂ d) Green house gases.
36. Population explosion will cause
a) Biodiversity b) Stress on the ecosystem
c) Better communication d) Energy storage.
37. The Protocol that reduces green house gas emissions are
a) Kyoto protocol b) Cartagena protocol
c) Montreal Protocol d) Delhi protocol.
38. Global warming could affect
a) Climate b) Increase in sea level c) Melting of glaciers d) All of the above.
39. Primary cause of acid rain around the world is due to
a) CO₂ b) CO c) SO₂ d) O₃.
40. Reduction in brightness and the famous Taj Mahal is due to
a) Global warming b) Green house gases
c) Ozone deflection d) Air pollution.

CBCS Scheme

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Question Paper Version : C

First/Second Semester B.E. Degree Examination, June/July 2018

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the thirty questions. each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing & darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The leader of "Chipko Movement" is
a) Sunderlal Bahuguna
b) Medha Patkar
c) Vandana Shiva
d) Mahatma Gandhi
 2. GILO is a project associated with
a) Environment protection
b) Environment education
c) Women education
d) None of these
 3. India has the largest share of which of the following :
a) Manganese
b) Mica
c) Copper
d) Silver
 4. Physical pollution of water is due to
a) Dissolved oxygen
b) pH
c) Turbidity
d) None of these
 5. Which of the following is the source of fly ash?
a) Vehicular exhaust
b) Sewage
c) Thermal power plant
d) All of these
 6. The permissible range of pH for drinking water as per the Indian standard is
a) 6 to 9
b) 6.5 to 8.5
c) 6 to 8.5
d) 6.5 to 7.5

-C1-

7. Noise pollution is controlled by
a) Reducing the noise at the source b) Preventing its transmission
c) Protecting the receiver d) All of these
8. LPG is a mixture of
a) N_2 and H_2S b) CO_2 and N_2
c) Propane and butane d) Methane and CO_2
9. Direct conversion of solar energy is attained by
a) Solar photovoltaic cells b) diesel hybrid system
c) Solar thermal system d) None of these.
10. Nuclear wastes are active for
a) 5 years b) 10 years c) 50 years d) centuries
11. Molasses from sugar industry is used to generate
a) Biodiesel b) Hydrogen c) Bioethanol d) Biomethanol
12. Demography is the study of
a) Animals behaviour b) Population growth
c) Rivers d) Forests
13. The major objectives of family welfare program is
a) Employment generation b) Population growth and control
c) Disease control d) None of these
14. Which green house gas is known as colorless, non flammable, sweetish odour and laughing gas?
a) Methane b) CO_2
c) Nitrous oxide d) SO_2
15. Nuclear fission reaction involves the bombardment of ^{235}U by
a) Electrons b) Neutrons
c) Protons d) Alpha radiation
16. Remote sensor detects
a) Electromagnetic radiation b) only visible radiations
c) only IR radiations d) only UV radiations
17. The tiger conservation project was started in
a) 1973 b) 1975
c) 1981 d) 2000
18. Centre for science and environment is
a) Government organization b) Non government organization
c) International body d) None of these
19. Carbon cycle involves
a) Ammonia, nitrate and proteins b) Carbon dioxide, water and energy
c) Sulphur dioxide, Sulphate & Proteins d) Carbon, Nitrogen and Oxygen

20. Deforestation means
a) conservation of forest
b) destruction of forest
c) monocrop cultivation
d) decrease in agriculture
21. Blue baby syndrome is caused by the contamination of water due to
a) Phosphates
b) Sulphur
c) Arsenic
d) Nitrates
22. Excess fluorides in drinking water cause
a) Blue babies
b) Fluorosis
c) Beriberi
d) Rickets
23. Fixation of nitrogen is done by
a) Lightening
b) Fixing bacteria
c) Fertilizer factory
d) All of these
24. Recycled waste water can be used for
a) crop irrigation
b) landscape gardening
c) Replenishing fast depleting aquifers
d) All of these
25. The sequence of eating and being eaten in an ecosystem is called
a) Food chain
b) Carbon cycle
c) Food web
d) hydrological cycle
26. In aquatic ecosystem phytoplankton can be considered as a
a) Consumer
b) Producer
c) Macro consumer
d) None of these
27. Ecological pyramids are studies of
a) Pyramid of Energy
b) Pyramid of numbers
c) Pyramid of biomass
d) all of these
28. E.I.A can be expanded as
a) Environment & Industrial act
b) Environment & Impact Activities
c) Environmental Impact Assessment
d) None of these
29. Water logging is a phenomena in which
a) Water patterns are rotated
b) Soil root zone becomes saturated due to over irrigation.
c) Erosion of soil
d) Soil degradation
30. The permissible limit of Lead in domestic portable water as per BIS is
a) 0.05 mg/L
b) 0.005 mg/L
c) 0.5 mg/L
d) 5 mg/L

CBCS SCHEME

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17CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are ion selective electrodes? Discuss the construction and working of a glass electrode. (07 Marks)
- b. Define Battery. Explain construction, working and uses of (Ni – Metal Hydride) battery. (07 Marks)
- c. What are fuel cells? How it is different from a galvanic cell? Mention any two advantages of fuel cell. (06 Marks)

OR

- 2 a. Derive Nernst equation for electrode potential. (06 Marks)
- b. What are concentration cells? The emf of the cell
 $\text{Ag} | \text{AgNO}_3 (0.0083\text{M}) || \text{AgNO}_3 (\text{XM}) | \text{Ag}$
was found to be 0.074 V at 298 K. Calculate the value of X and write the cell reactions. (07 Marks)
- c. Describe the construction, working and applications of methanol –oxygen fuel cell. (07 Marks)

Module-2

- 3 a. Define corrosion. Explain electrochemical theory of corrosion by taking Iron as an example. (07 Marks)
- b. What is Cathodic protection? Explain Sacrificial Anode and Impressed Current method for prevention of corrosion. (07 Marks)
- c. Define electroless plating. What are the differences between electroplating and electroless plating? (06 Marks)

OR

- 4 a. How does the following factors affect the rate of corrosion?
(i) Nature of the corrosion product
(ii) Temperature
(iii) pH. (06 Marks)
- b. Explain the process of electroplating of chromium and its applications. (07 Marks)
- c. Discuss the process of electroless plating of copper and explain its application in the manufacture of Printed Circuit Board (PCB). (07 Marks)

Module-3

- 5 a. Define Gross and Net calorific values of a solid on a liquid fuel. Calculate the gross and net calorific value of a sample of coal 0.5 g of which when burnt in a bomb calorimeter raised the temperature of water from 293 K to 296.4 K. The mass of water is 1000 g and water equivalent of calorimeter is 350 g. The specific heat of H₂O is 4.187 kJ/kg/K, latent heat of steam is 2454 kJ/kg. The coal sample contains 93% carbon, 5% hydrogen and 2% ash. (07 Marks)

- b. What is meant by knocking? What are its ill effects? Discuss the mechanism of knocking by giving relevant equations. (07 Marks)
- c. Explain the construction and working of a PV cell. (06 Marks)

OR

- 6 a. What is cracking of petroleum? Describe the fluidized bed catalytic cracking. (07 Marks)
- b. Explain the production of solar grade silicone by Union Carbide process. (07 Marks)
- c. Write a note on :
(i) Power alcohol (ii) Biodiesel. (06 Marks)

Module-4

- 7 a. What is addition polymerization? Illustrate the mechanism of addition polymerization by taking Vinyl Chloride as an example. (07 Marks)
- b. Describe the manufacture of (i) PMMA (ii) Epoxy resin. Mention the uses. (07 Marks)
- c. A polymer sample containing 100, 250 and 300 molecules having molar mass 10^3 g/mol, 10^4 g/mol and 10^5 g/mol respectively. Calculate the number average and weight average molecular mass of polymer. (06 Marks)

OR

- 8 a. What is glass transition temperature? Explain any three factors affecting T_g . (07 Marks)
- b. What are elastomers? Give the synthesis and applications of
(i) Silicone rubber (ii) Polycarbonate. (07 Marks)
- c. What are conducting polymers? Discuss the conduction mechanism in polyaniline. (06 Marks)

Module-5

- 9 a. Define Priming and Foaming. Mention the reasons for priming and foaming in the boiler with any two prevention steps. (07 Marks)
- b. What is desalination? Explain the desalination of water by reverse osmosis. (06 Marks)
- c. Describe the synthesis of nano-materials by Sol-gel process. (07 Marks)

OR

- 10 a. Define COD. In COD test 25.5 cm^3 and 12.5 cm^3 of 0.05N FAS solution and required for blank and sample titration respectively. The volume of the test sample used is 25 cm^3 . Calculate the COD of the sample solution. (07 Marks)
- b. Explain the precipitation method for preparation of nanomaterials with an example. (07 Marks)
- c. Write a note on Fullerenes and Composites. (06 Marks)

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CBCS SCHEME

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15CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Derive Nernst equation for single electrode potential. (05 Marks)
b. Define electrolyte concentration cell. The e.m.f of cell $\text{Ag}|\text{AgNO}_3 (0.001\text{M})|| \text{AgNO}_3(\text{XM})|\text{Ag}$ is 0.0591 V at 25°C. Find the value of X. (05 Marks)
c. Explain the following battery characteristics:
i) Cell potential
ii) Capacity
iii) Cycle life. (06 Marks)

OR

- 2 a. Define reference electrode. Discuss the construction and working of Ag-AgCl electrode. (05 Marks)
b. Describe the construction and working of Lithium – ion battery. Mention its application. (05 Marks)
c. Describe construction, working and application of methanol O_2 fuel cell using H_2SO_4 as electrolyte. (06 Marks)

Module-2

- 3 a. Explain electrochemical theory of corrosion taking Iron as an example. (05 Marks)
b. Explain the following factors affecting corrosion
i) Nature of corrosion product
ii) Ratio of Anodic to cathodic Area
iii) p^{H} of the medium. (05 Marks)
c. Describe electroplating of chromium (decorative and Hard). Mention the reasons for not using chromium Anode in electroplating of chromium. (06 Marks)

OR

- 4 a. Explain waterline and pitting corrosion. (06 Marks)
b. What is metal finishing? Mention technological importance of metal finishing. (05 Marks)
c. Describe electro-less plating of copper with plating reactions. (05 Marks)

Module-3

- 5 a. Define Cracking. Explain fluidized bed catalytic cracking method with a neat diagram. (05 Marks)
b. What is Reforming of petroleum? Give any three reactions involved in reforming. (05 Marks)
c. What is photovoltaic cell? Explain the construction and working of photovoltaic cell. Mention any two advantages. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Calculate the Gross or Net calorific value of a coal sample from the following data obtained from Bomb calorimetric experiment. (05 Marks)
- | | | | |
|------|---------------------------------|---|---------------------------------|
| i) | Weight of coal | = | $0.65 \times 10^{-3} \text{kg}$ |
| ii) | Weight water in calorimeter | = | 1200g |
| iii) | Water equivalent of calorimeter | = | 400g |
| iv) | Latent heat of steam | = | $587 \times 4.2 \text{kJ/kg}$ |
| v) | Rise in temperature | = | 1.8°C |
| vi) | Sp-heat of water | = | 4.187kJ/kg % of H = 5 |
- b. Explain the modules, panels and arrays of the design of PV cell. (06 Marks)
- c. Explain the purification of silicon by zone refining process. (05 Marks)

Module-4

- 7 a. Explain free radical mechanism for addition polymerization taking vinyl chloride as an example. (06 Marks)
- b. Describe the synthesis and applications of the following polymer.
- | | | |
|-----|-------------------|------------|
| i) | Plexiglass (PMMA) | |
| ii) | Polyurethane | (06 Marks) |
- c. What is glass transition temperature? Discuss how flexibility of polymer chain affects glass transition temperature. (04 Marks)

OR

- 8 a. Calculate number average and weight average of a polymer in which 200 molecules of 1000 g/mole, 300 molecules of 2000g/mole and 500 molecules of 3000 g/mole are present respectively. (06 Marks)
- b. Explain the synthesis, properties and application of silicon rubber. (05 Marks)
- c. What is polymer composite? Describe the synthesis and application of Kevlar fibre. (05 Marks)

Module-5

- 9 a. Explain Scale and Sludge formation in the boiler. (05 Marks)
- b. Explain determination of DO (Dissolved O₂) by Winkler's method. (06 Marks)
- c. Write a note on fullerene. (05 Marks)

OR

- 10 a. Explain desalination of sea water by ion selective electro dialysis method. (05 Marks)
- b. Explain the synthesis of nanomaterial by chemical vapour condensation method. Mention advantages of this method. (05 Marks)
- c. Write short notes on Carbon nanotubes and Dendrimers. (06 Marks)

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14CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019
Engineering Chemistry

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
 ONE full question from each module.**

Module - 1

- 1 a. Derive Nernst equation for electrode potential. (05 Marks)
- b. What are reference electrodes? Describe the construction and working of calomel electrode. (05 Marks)
- c. Explain the construction, working and applications of Ni-MH battery. (05 Marks)
- d. What are fuel cells? Explain the construction and working of Methanol-Oxygen fuel cell. (05 Marks)
- 2 a. What are concentration cells? Derive an expression for emf of a concentration cell. (05 Marks)
- b. Explain an experimental method of determination of pH using glass electrode. (05 Marks)
- c. Describe the construction, working and applications of Zn-Air battery. (05 Marks)
- d. What are fuel cells? How they differ from a battery? (05 Marks)

Module - 2

- 3 a. Define the term corrosion. Explain electrochemical theory of corrosion with respect to iron. (06 Marks)
- b. Explain the effect of the following factors on the rate of corrosion:
 - i) Relative area of anode and cathode
 - ii) Nature of corrosion product. (04 Marks)
- c. What is electroless plating? Explain electroless plating of copper on PCB. (06 Marks)
- d. Explain the process of galvanizing. (04 Marks)
- 4 a. Explain the following types of corrosion:
 - i) Pitting corrosion ii) Water line corrosion. (04 Marks)
- b. What is cathodic protection? Explain the following methods of control of corrosion:
 - i) Sacrificial anode ii) Impressed current. (06 Marks)
- c. Explain the following terms:
 - i) Polarization and ii) Decomposition voltage. (06 Marks)
- d. Explain the process of electroplating of decorative chromium. (04 Marks)

Module - 3

- 5 a. What are chemical fuels? Give the classification of fuels with an example. (05 Marks)
- b. What is cracking process? Explain fluidized bed catalytic cracking with neat diagram. (05 Marks)
- c. What are photovoltaic cells? Explain construction and working of photovoltaic cell. (05 Marks)
- d. Discuss the production of solar grade silicon by union carbide process. (05 Marks)

- 6 a. What is gasoline knocking? Explain its mechanism with chemical reactions. (05 Marks)
 b. Calculate GCV and NCV using the following data. Mass of coke = 0.8×10^{-3} kg, mass of water = 2.5 kg, water equivalent of calorimeter = 0.5 kg, specific heat of water = 4.187 kJ/kg/K, increase in temperature = 2.8 K, latent heat = 2457 kJ/kg, H = 2.5%. (05 Marks)
 c. Explain doping of silicon by diffusion technique. (04 Marks)
 d. Discuss the physical and chemical properties of silicon relevant to photovoltaics. (06 Marks)

Module – 4

- 7 a. Explain addition and condensation polymerization with example. (04 Marks)
 b. What is glass transition temperature? Explain any two factors effecting it. (06 Marks)
 c. What are polymer composites? Explain the synthesis and applications of Kevlar fibres. (05 Marks)
 d. Explain synthesis and applications of the following polymers: i) PMMA ii) Teflon. (05 Marks)
- 8 a. Explain free radical mechanism of polymerization of vinylchloride as an example. (05 Marks)
 b. What are elastomers? Give the synthesis and applications of silicone rubber. (05 Marks)
 c. What is conducting polymer? Explain the mechanism of conduction in polyaniline. (05 Marks)
 d. A polymer has the following composition:
 100 molecules of molecular mass 1000 g/mol, 200 molecules of molecular mass 2000 g/mol and 500 molecules of molecular mass 5000 g/mol. Calculate the number and weight average molecular weights of a polymer. (05 Marks)

Module – 5

- 9 a. What is boiler feed water? Explain the scale and sludge formation in boiler. (05 Marks)
 b. What is desalination? Explain the process of desalination of water by electro dialysis. (05 Marks)
 c. What are nano materials? Explain the synthesis of nano materials by precipitation and gas condensation processes. (06 Marks)
 d. Write a note on nano composites. (04 Marks)
- 10 a. Define BOD and COD. 25 cm³ of an industrial effluent requires 12.5 cm³ of 0.5N K₂Cr₂O₇ solution for complete oxidation. Calculate the COD of the effluent. (06 Marks)
 b. Explain activated sludge process of sewage treatment with neat diagram. (04 Marks)
 c. Explain synthesis of nano materials by chemical vapour condensation and sol-gel processes. (06 Marks)
 d. Write a note on carbon nano tubes. (04 Marks)

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Question Paper Version : **B**

First Semester B.E Degree Examination, Dec.2018/Jan.2019

Technical English – I**(COMMON TO ALL BRANCHES)**

Time: 3 hrs.]

[Max. Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the hundred questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. _____ do you think has stolen the watch?
a) Who b) Whom c) Whose d) All of these
2. _____ do you think I met at the party?
a) Who b) Whom c) Whose d) None of these
3. This dress is _____ to that.
a) Preferable b) More preferable c) Most preferable d) None of these
4. Our teacher has read _____ book of this library.
a) each b) every c) little d) small
5. The plural form of the compound noun 'Son-in-law' is
a) Son-in-laws b) Sons-in-law c) Sons-in-laws d) Son-in-law
6. Which of the following Nouns is generally used as plural form?
a) Economics b) Furniture's c) Public d) News
7. The meaning of the Noun 'Advices' is
a) Counsel b) Opinion c) Information d) Advise
8. You and Ahmed have wasted _____ time
a) they b) your c) yours d) him
9. The Abstract noun of the verb 'Go' is
a) Goit b) Glutton c) Gone d) Go

Select the appropriate Question Tag, to complete the following sentences: (Q.No.10 to Q.No.13)

10. You are not serious; _____
 a) are you? b) had you? c) were you? d) aren't you?
11. We can't buy this costly car, _____
 a) can't we? b) can we? c) could we? d) shouldn't we?
12. Give me a hint, _____
 a) will you? b) won't you? c) can you? d) Do you?
13. There are many beautiful lakes in Udaipur, _____
 a) are there? b) weren't there? c) aren't there? d) isn't there?

Choose the appropriate Homophones of the following words: (Q.No.14 to Q.No.18)

14. Ad : _____
 a) Had b) Add c) Odd d) and
15. Beet : _____
 a) Beat b) Boat c) Bate d) Bird
16. Scene : _____
 a) Seen b) Rain c) See d) Saw
17. Tea : _____
 a) Seen b) Tee c) rite d) sow
18. Right : _____
 a) Bright b) Light c) Rite d) effect

Select the missing silent letter/s from the options given. Check the spelling carefully (Q.No.19 to Q.No.23)

19. _____ onest
 a) h b) b c) k d) c
20. Com _____
 a) d b) f c) e d) b
21. As _____ ma
 a) t b) th c) ss d) kn
22. Fau _____
 a) t b) gh c) x d) z

23. _____ neumonia
a) p b) ch c) gh d) k
24. Which of the following has / a:/ sound
a) art b) eat c) date d) get
25. Which of the following has /i:/ sound
a) Fact b) eat c) wit d) few
26. Which of the following has |P| sound
a) but b) pat c) wit d) get
27. Which of the following is an adjective form of "WORD"
a) vocal b) verbal c) oral d) word
28. The adjective form of the noun "Attendance" is
a) Attend b) Attentive c) Attendant d) Presence
29. The pronunciation of definite article "The", before a vowel is
a) thee b) th-uh c) th-hu d) th-ch
30. The baker prepared some 'eats' for Christmas. Here the word 'eats' is
a) a noun b) a pronoun c) a verb d) an adverb
31. They have reached the place _____ time
a) on b) in c) at d) over
32. The _____ of an earthquake is the movement of tectonic plates
a) Reason b) Cause c) Habit d) Wind
33. One who knows many languages is called
a) Linguist b) Emigrant c) Omnipotent d) Fotalist
34. A person walking and not using a vehicle is called
a) Patriot b) Pessimist c) Pedestrian d) Usurer
35. One who looks at the dark side of things
a) Pessimist b) Optimist c) Omniscient d) Omnipotent

Choose the correct parts of speech of the underlined words: (Q.No.36 to Q.No.41)

36. "Our blessings come from above"
a) Noun b) Pronoun c) Verb d) Adverb
37. "The stars are shining above in the sky"
a) Noun b) Pronoun c) Adverb d) Adjective
38. "None but the brave deserve the best"
a) Preposition b) Noun c) Conjunction d) Verb

39. "She tried hard but did not succeed".
a) Noun b) Conjunction c) Adverb d) Preposition
40. Ask either of them to leave
a) Verb b) Adverb c) Pronoun d) Adjective
41. I believe in human 'goodness'.
a) Abstract Noun b) Proper Noun c) Common Noun d) Collective Noun
42. A spendthrift is devoid _____ foresight and often runs _____ debt
a) in, in b) of, in c) of, into d) of, to
43. Have you read the last _____ one poem of the book?
a) before b) but c) either d) because
44. He is wise _____ he is young
a) though b) where c) before d) because
45. You are _____ my friend _____ philosopher
a) both, and b) and, both c) and, and d) both, both
46. _____ How unworthy of you!
a) pooh! b) Hush! c) Fie! d) ouch!
47. Much _____ since they were last seen here
a) has happened b) had happened
c) was happening d) would have happening
48. He _____ waiting for her since morning.
a) has been b) have been c) had d) would
49. I suggest that Prakash _____ walk on and try to get help.
a) would b) can c) could d) should
50. Some checks _____ to be put on the mushrooming of frivolous unions.
a) also have b) has c) will also d) shall also
51. He would not have written this letter if he _____ heard the news.
a) had not b) would have c) will have d) shall had

Choose the correct spelling words which are commonly mis-spelt : (Q.No. 52 to Q.No.56)

52. a) Advisable b) Adviesable c) Advisible d) Adviseable
53. a) Admission b) Admision c) Admision d) Admisionne
54. a) Adress b) Address c) Adres d) Addres

55. a) appiarance b) appearence c) apparance d) appearance
56. a) Committment b) Comitment c) Commitment d) Commitment

Choose the correct Antonym for the following words (Q.No.57 to Q.No.61)

57. Interest : _____
a) uninterest b) disinterest c) non-interest d) curious
58. Blunt : _____
a) dull b) sharp c) gloomy d) wax
59. Hostile : _____
a) Innocent b) Friendly c) Lazy d) Crazy
60. Fresh : _____
a) Stale b) Stole c) Steal d) Steel
61. Postpone : _____
a) Prepone b) Before c) Advance d) Soon

Select the name of the collective Noun of the following: (Q.No.62 to Q.No.64)

62. A _____ of ants
a) board b) swarm c) council d) fleet
63. A _____ of ships
a) fleet b) posy c) crew d) bunch
64. A _____ of Elephants
a) Stack b) Herd c) mob d) gang
65. Which of these is a communication skill?
a) Swimming b) Running c) Sleeping d) Asking Questions
66. Which of these is an intrapersonal communication barrier?
a) Lack of knowledge b) Reading c) Listening d) Writing
67. Which of the following is called an Aspiration?
a) elongated pronunciation b) actual sound
c) forceful release of air d) sound
68. In business, oral communication is face-to-face
a) in some situation b) in no situation
c) in all but one situation d) in all situation

69. Which of the following skills has the largest share in communication time in schools/colleges?
 a) Reading b) Listening c) Writing d) Speaking
70. In general, the oral communication is the interchange of _____ between the sender and the receiver.
 a) cues and clues b) written messages c) signs and gestures d) verbal messages
71. Comparatively, oral communication is better than written communication in
 a) Providing opportunity to refer back b) Conveying feelings and emotions
 c) Saving time d) Conveying facts and opinions
72. Which of the following is a Interpersonal Communication barrier?
 a) Language b) Listening c) Reading d) Writing
73. Body language is also known as
 a) Noise b) Overflow c) Leakage d) Verbal
74. Which of these is not a communication skill?
 a) Swimming b) Asking question c) Writing d) Body language
75. The police _____ arrested the thief
 a) has b) have c) has been d) will
76. The horse and carriage _____ ready
 a) is b) are c) were d) have
77. My brother likes comics _____ much
 a) Very b) Too c) most d) so
78. _____ boys passed with distinction
 a) full b) little c) a few d) number
79. It is _____ hot to drink
 a) very b) so much c) Too d) more
80. I complimented him _____ his brilliant success in the examination
 a) over b) for c) to d) on
81. As I approached _____ him, he turned and walked away
 a) to b) by
 c) beside d) no preposition is needed
82. _____ uranium, we can use another metal, thorium to produce nuclear power
 a) Beside b) Besides c) Against d) of
83. _____ all your patent medicines, you haven't cured me _____ this cold
 a) of, of b) of, from c) with, of d) with, from

84. If you live _____ your means, you will, run _____ debt.
a) above, in b) beyond, into c) beyond, in d) in. on

Choose the correct synonym for the following words (Q.No.85 to Q.No.89)

85. Amuse : _____
a) Entertain b) Enroll c) engage d) ended
86. Tranquil : _____
a) calm b) storm c) bold d) loud
87. Darling : _____
a) near b) dear c) close d) full
88. Event : _____
a) Vain b) Void c) incident d) vile
89. Queer : _____
a) curious b) gain c) deep d) weary

Select the correct Prefix or Suffix from the given options to complete the gap: (Q.No.90 to Q.No.95)

90. _____ adjustment.
a) Mal b) All c) non d) un
91. _____ driven.
a) Wise b) Self c) Un d) Re
92. _____ chairman
a) Wise b) Vice c) Nice d) Un
93. Affection _____
a) ate b) eat c) ade d) es
94. Astro _____
a) logo b) logist c) loger d) ist
95. Micro _____
a) alia b) phone c) scene d) ship

Choose the correct pair of words from the given options (Q.No.96 to Q.No.100)

96. Accept: _____
a) Expect b) Except c) Eccept d) Excess
97. Fain: _____
a) Fine b) Fane c) Feign d) Fan

98. Naughty: _____
a) knotty b) notty c) note d) notice
99. Dissent: _____
a) Decent b) Descent c) Dissect d) Decence
100. In: _____
a) Hen b) Inn c) Him d) Hymn

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First Semester B.E. Degree Examination, Dec.2018/Jan.2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the working of PN junction diode under forward and reverse biased conditions. (06 Marks)
- b. Explain how zener diode helps in voltage regulation with neat circuit diagram. (06 Marks)
- c. Explain with neat circuit diagram and waveforms the working of center-tap full wave rectifier. Show that efficiency of full-wave rectifier is 81%. (08 Marks)

OR

- 2 a. Explain the operation of half-wave rectifier with capacitor filter with neat circuit diagram and waveforms. (06 Marks)
- b. Show that the ripple factor of a half-wave rectifier is 1.21 and efficiency is 40.5%. (06 Marks)
- c. Explain VI characteristics of photodiode and its operation. (04 Marks)
- d. For the circuit shown in Fig.Q2(d) find (i) current and voltages in the circuit for $R_L = 450 \Omega$. (04 Marks)



Fig.Q2(d)

Module-2

- 3 a. Explain the drain and transfer characteristics of a JFET with neat circuit diagram. (08 Marks)
- b. Explain the basic structure and operation of JFET with neat diagrams. (08 Marks)
- c. For a JFET $I_{DSS} = 9 \text{ mA}$ and $V_{GS(off)} = -8 \text{ V}_{(max)}$ determine drain current for $V_{GS} = -4 \text{ V}$. (04 Marks)

OR

- 4 a. Explain the operation of an enhancement MOSFET with neat circuit diagram. (06 Marks)
- b. Explain CMOS as an inverter with neat circuit diagram. Give its equivalent circuit and its advantages. (08 Marks)
- c. Explain VI characteristics of SCR. (06 Marks)

Module-3

- 5 a. Explain the block diagram of an operational amplifier. (06 Marks)
- b. Explain the operation of an op-amp as a non-inverting amplifier with neat diagram and waveforms. (06 Marks)
- c. Define the following terms with respect to op-amp. (08 Marks)
 - (i) CMRR (ii) Slewrate (iii) μp offset voltage and current (iv) μp bias current

OR

- 6 a. Explain op-amp as a subtractor with neat circuit diagram. (08 Marks)
- b. Explain the different μp modes of an op-amp. (06 Marks)

- c. For an op-amp circuit shown in Fig.Q6(c), find the output V_{O1} and V_{O2} .

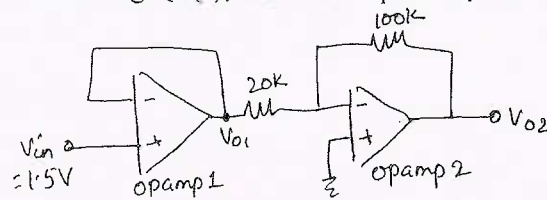


Fig.Q6(c)

Also write the function of each op-amp used.

(06 Marks)

Module-4

- 7 a. With neat circuit diagram explain how transistor is used as an voltage amplifier. Derive an equation for A_v . (08 Marks)
 b. Explain the voltage series feedback circuit and derive an equation for voltage gain A_v with feedback. (04 Marks)
 c. Explain RC phase-shift oscillator with circuit diagram and necessary equations. (08 Marks)

OR

- 8 a. With neat circuit diagram explain how transistor can be used to switch an LED ON/OFF and give the necessary equation. (08 Marks)
 b. The transistor in common emitter configuration is shown in Fig.Q8(b) with $R_c = 10 \text{ k}\Omega$ and $\beta_{DC} = 200$ determine
 (i) V_{CE} at $V_{in} = 0$ (ii) $I_{B(\min)}$ to saturate the collector current (iii) $R_{B(\max)}$ when $V_{in} = 5V$.
 $V_{CE(\text{sat})}$ can be neglected. (04 Marks)

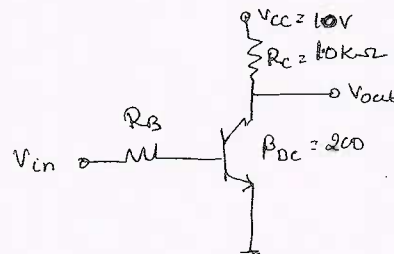


Fig.Q8(b)

- c. Explain the operation of IC-555 as an Astable oscillator with neat circuit diagram and necessary equation. (08 Marks)

Module-5

- 9 a. Design Full adder circuit and implement it using basic gates. (10 Marks)
 b. Explain the basic elements of communication system with block diagram. (06 Marks)
 c. Find
 (i) $(1010111011110101)_2 = (?)_{16}$ (ii) $(FA876)_{16} = (?)_2$ (04 Marks)

OR

- 10 a. State and prove De Morgan's theorems. (04 Marks)
 b. Explain the working of a 3-bit ripple counter with neat circuit diagram and timing diagrams. (08 Marks)
 c. Explain the working of RS flip flop with truth table and diagram. (06 Marks)
 d. Subtract the following using 2's complement:
 (i) $11100 - 10011$ (02 Marks)

CBCS SCHEME

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18CPS13

First Semester B.E. Degree Examination, Dec.2018/Jan.2019

C Programming for Problem Solving

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the basic structure of a C program with example. (10 Marks)
- b. Define a variable. Explain the rules for constructing variables in C language. (04 Marks)
- c. Write a C program to compute simple interest. Draw the flowchart for the same. (06 Marks)

OR

- 2 a. Define data type. Explain primitive data types supported by C language with example. (10 Marks)
- b. List all the operators used in C language and evaluate following expression.
 - i) $x = a - b/3 + c * 2 - 1$ when $a = 9, b = 12, c = 3$
 - ii) $10! = 10 \parallel 5 < 4 \& \& 8.$ (04 Marks)
- c. Describe the various type computers. (06 Marks)

Module-2

- 3 a. Explain the formatted I/O functions of C language with syntax and example. (04 Marks)
- b. Write a C program to implement commercial calculator using switch statement. (06 Marks)
- c. Write the syntax of different branching statements and explain their working. (10 Marks)

OR

- 4 a. Differentiate between while loop and do-while loop. Explain with syntax and example. (08 Marks)
- b. Write a program to find the sum of N natural numbers using for loop. (04 Marks)
- c. Write a C program to plot Pascal's triangle. (08 Marks)

Module-3

- 5 a. Define array. Write the syntax for and with declaring and initializing 1D and 2D array with suitable example. (10 Marks)
- b. Write a C program to find the transpose of a give matrix. (10 Marks)

OR

- 6 a. Define string. List out all string manipulation function. Explain any two with examples. (10 Marks)
- b. Write a C program for [consider integer data] :
 - i) Bubble sort
 - ii) Linear search. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. What is a function? Explain the different type of functions based on parameter. (10 Marks)
b. Write a program to find the factorial of a given number using functions. (14 Marks)
c. Write a program to find GCD and LCM of two numbers using concept of functions. (06 Marks)

OR

- 8 a. Explain recursion and write a program to find n^{th} term of Fibonacci series. (10 Marks)
b. Give the scope and lifetime of following :
i) External variable ii) Static variable iii) Automatic variable
iv) Static variable iv) Register variable. (10 Marks)

Module-5

- 9 a. What is a structure? Explain the syntax of structure declaration in C with example. (04 Marks)
b. Write note on : i) Arrays within structures ii) arrays of structures. (04 Marks)
c. Implement structures to read, write and compute average marks and the students scoring above and below average marks for class of N students. (12 Marks)

OR

- 10 a. What is a pointer? Show how pointer variable is declared and initialized. (05 Marks)
b. Explain any two preprocessor directives in C. (05 Marks)
c. Write a C program to find sum and mean of all elements in an array using pointer. (10 Marks)

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17PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. What is an algorithm? Write an algorithm to find largest of 3 numbers. (08 Marks)
b. Explain any five operators used in C language. (10 Marks)
c. Explain two types of type conversions. (02 Marks)

OR

- 2 a. Explain the structure of 'C' program with an example program. (10 Marks)
b. Explain scanf() & printf() function in C language with syntax and example program. (10 Marks)

Module-2

- 3 a. Explain if, if-else, nested if-else and cascaded if-else with examples and syntax. (10 Marks)
b. Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. An error message should be displayed, if any attempt is made to divide by zero. (10 Marks)

OR

- 4 a. List the differences between while loop and do-while loop. Write a C program to find the sum of natural numbers from 1 to N using for loop. (10 Marks)
b. Write a C program to read a year as an input and find whether it is a LEAP YEAR or not. (04 Marks)
c. Write a C program to find reverse of a number and check whether it is a PALINDROME or not. (06 Marks)

Module-3

- 5 a. What is an array? Explain the declaration and initialization of one dimensional and two dimensional array with an example. (10 Marks)
b. Explain any three string manipulation library function with example. (06 Marks)
c. Write a C program to implement string copy operation STRCOPY(Str1, Str2) that copies a string Str1 to another string Str2 without using library function. (04 Marks)

OR

- 6 a. What is function? Explain the two categories of argument passing techniques, with example. (10 Marks)
b. Write a C function isprime(num) that accepts an integer argument and return 1 if the argument is a prime or a 0 otherwise. Write a program that invokes this function to generate prime number between the given range. (10 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. What is structure data type? Explain. (04 Marks)
 b. Show how a structure variable is passed as a parameter to a function, with an example. (06 Marks)
 c. Explain the concept of array of structures, with a suitable C program. (10 Marks)

OR

- 8 a. What is FILE? Explain fopen(), fclose() functions. (05 Marks)
 b. Explain various modes of FILE. (05 Marks)
 c. Given two files "Studentname.txt" and "USN.txt" that contains students name and USN respectively. Write a C-program to create a new file called "output.txt" and copy the contents of files "Studentname.txt" and "USN.txt" into output file in the sequence shown below :

Student name	USN
Name – 1	USN – 1
Name – 2	USN – 2
–	–
–	–
–	–
–	–

(10 Marks)

Module-5

- 9 a. Define a pointer. Explain how pointer variable is declared and initialized. (05 Marks)
 b. What are primitive and non – primitive data types? Give examples. (05 Marks)
 c. Write a program using pointers to compute sum, mean and standard deviation of all elements stored in an array of "n" real numbers. (10 Marks)

OR

- 10 a. Explain any 2 pre- processor directives in 'C' language. (05 Marks)
 b. What is a STACK? Explain its applications. (05 Marks)
 c. What is a QUEUE? Explain with example. (05 Marks)
 d. Write a program to swap 2 numbers using call-by-reference method. (05 Marks)

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CBCS SCHEME

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15PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. What is an operator? Explain the arithmetic, logical, and bitwise operators in C language. (08 Marks)
- b. Write a C program which takes as input p,t,r. Compute the simple interest and display the result. (08 Marks)

OR

- 2 a. What is the purpose of printf() statement? Explain the formatted printf() along with examples. (08 Marks)
- b. What is type conversion? Illustrate different ways of type conversion with an example. (08 Marks)

Module-2

- 3 a. Write a C program to calculate area of circle, rectangle and triangle using SWITCH case. (08 Marks)
- b. What is two way selection statements? Explain nested if statement and cascaded IF-ELSE with examples. (08 Marks)

OR

- 4 a. Write a C program to find GCD of two non-zero integer numbers. If the first number is less than the second number, then the program must exchange the two numbers before computing GCD. (08 Marks)
- b. Illustrate with an example break and continue statements. (03 Marks)
- c. Compare while loop and do-while loop with syntax, flowchart and examples. (05 Marks)

Module-3

- 5 a. Define an array. Explain declaration and initialization of one dimensional array with an example. (08 Marks)
- b. Write a C program to accept an alphanumeric (Eg : "ABC123DEFR") string, to count the number of characters and digits. Also display the result. (08 Marks)

OR

- 6 a. Explain any four string manipulation functions with examples. (08 Marks)
- b. Write a C program to check a number is a prime number or not. (04 Marks)
- c. What is function? Write a C program to find square of a number using function. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Write a C program to create a structure using typedef and input the following details of "N" students (USN : String Name : String Average : float grade : char). Print the names of students with their average is $\geq 60\%$. (10 Marks)
- b. Differentiate between structure and union with examples. (06 Marks)

OR

- 8 a. Explain how the structure variable passed as a parameter to a function with example. (06 Marks)
- b. Explain the following file operations along with syntax and examples :
i) fopen() ii) fclose() iii) fscan() iv) fprintf() v) fgets(). (10 Marks)

Module-5

- 9 a. List out various memory allocation and de-allocation mechanisms available in C? Write a C program to demonstrate them. (08 Marks)
- b. Discuss any two preprocessor directives in 'C'. (03 Marks)
- c. Define pointer. What are the operators used by pointer with an example. List the advantages and disadvantages of pointer. (05 Marks)

OR

- 10 a. Describe the two ways of passing parameters to function with examples. (08 Marks)
- b. Define stack. Explain the primitive operations on the stack. Write a C program to demonstrate it. (08 Marks)

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First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019

Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting ONE full question from each module.

Module – 1

- 1 a. Explain the structure of typical C program. (06 Marks)
- b. What are the Data types available with C? Explain briefly with valid examples. (10 Marks)
- c. Write a program in C to find the area of a circle. (04 Marks)

- 2 a. Write a program in C to find the greatest of 3 numbers using conditional operator. (08 Marks)
- b. Write a guidelines to use scanf() function in C language. (08 Marks)
- c. What is an operator? Explain Relational operators in C. (04 Marks)

Module – 2

- 3 a. Explain the following with their syntax :
 - i) if – else
 - ii) cascaded if – else. (08 Marks)
- b. Explain the switch statement with a simple C program (04 Marks)
- c. Write a program in C to check the given alphabet is a VOWEL or not. (08 Marks)

- 4 a. Differentiate between while and do – while statement. (04 Marks)
- b. Explain the uses of jump statements in loop with example. (06 Marks)
- c. Write an Algorithm, flowchart and C program to find reverse of an integer number NUM and check whether it is PALINDROME or not. (10 Marks)

Module – 3

- 5 a. What is an Array? Wire the syntax of declaring a one – Dimensional and Two – Dimensional array. (06 Marks)
- b. Write a C program to input N integer into a single dimensional array and sort them in Ascending order using Bubble sort method. (10 Marks)
- c. How are strings are declared and initialized? Explain with example. (04 Marks)

- 6 a. What are string manipulation library functions? explain any two string manipulation with C program. (10 Marks)
- b. Explain the difference between “call by value” and “call by reference” with suitable example. (04 Marks)
- c. Design and develop a function isprime (x) that accepts an integer argument and returns 1 if the argument is prime and 0 otherwise. (06 Marks)

Module – 4

- 7 a. What is structure? Explain the syntax of structure declaration with example. (05 Marks)
- b. Explain Nested structure with example. (05 Marks)
- c. Write a C program to maintain a record of “n” student details using an array of structure with four fields (RollNumber, Name, Marks and Grade). Each field is of an appropriate data type. Print the marks of the student given name as input. (10 Marks)

- 8 a. Explain Basic Input and output operations on files management. (06 Marks)
b. Write a simple C program to pass a structure as a parameter to a function. (10 Marks)
c. Explain with syntax typedef statement. (04 Marks)

Module – 5

- 9 a. Explain the four Library routines called memory management function in C. (06 Marks)
b. Explain commonly used preprocessor directives and their functions. (10 Marks)
c. Explain the code Demonstrating the use of pointers to pointer. (04 Marks)
- 10 a. What are stack and Queues? Explain them with a neat diagram. (06 Marks)
b. Write a C program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of n natural/real numbers. (10 Marks)
c. Explain prefix and postfix expression using example. (04 Marks)

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18ME15

First Semester B.E. Degree Examination, Dec.2018/Jan.2019 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of Thermodynamic data hand book is permitted.*

Module-1

- 1 a. Explain briefly the principle of conversion of solar energy directly into electrical energy in a solar cell. (10 Marks)
 b. Write a note on wind energy and its conversion. (10 Marks)

OR

- 2 a. Explain I - law of thermodynamics. List the similarities and dissimilarities between work and heat. (10 Marks)
 b. Define the following term in relation to steam:
 (i) Dryness fraction
 (ii) Latent heat
 (iii) Degree of super heat
 (iv) Saturation temperature (10 Marks)

Module-2

- 3 a. Differentiate between water tube boiler and fire tube boiler. (04 Marks)
 b. List the boiler mountings and accessories and also mention their uses. (06 Marks)
 c. With neat sketch explain the working of Babcock and Wilcox boiler. (10 Marks)

OR

- 4 a. With a neat sketch explain the working of Pelton Wheel. (10 Marks)
 b. With a neat sketch explain the working of a Reciprocating pump, state the advantages and uses. (10 Marks)

Module-3

- 5 a. Differentiate between Two-stroke and Four stroke engine. (04 Marks)
 b. Explain with neat sketch construction and working of 4-stroke diesel engine with the help of theoretical P-V diagram. (10 Marks)
 c. A four stroke single cylinder Diesel engine piston diameter 250 mm and stroke 400 mm. The mean effective pressure is 4-bar and speed is 500 rpm. Diameter of the brake drum is 1000mm. The effective brake load is 400 N. Find IP, BP and FP. (06 Marks)

OR

- 6 a. What are the properties of good refrigerant? (04 Marks)
 b. Explain with neat sketch working principle of vapour compression refrigeration. (10 Marks)
 c. Explain the following :
 (i) Refrigeration effect
 (ii) Ton of refrigeration
 (iii) COP. (06 Marks)

Module-4

- 7 a. Write a note on application of ferrous and non-ferrous alloys. (06 Marks)
b. Define composite material. State the advantages and applications of composite material. (05 Marks)
c. Differentiate between Soldering, Brazing and Welding. (09 Marks)

OR

- 8 a. Differentiate between Open and Crossed belt drive. (06 Marks)
b. Enumerate the advantages and disadvantages of gear drive over belt drive. (06 Marks)
c. Derive an equation for length of belt in open belt drive. (08 Marks)

Module-5

- 9 a. Explain the following operation on lathe with suitable sketches:
(i) Turning (ii) Knurling (iii) Facing (iv) Thread cutting (10 Marks)
b. Explain the following operation on milling machine with suitable sketches:
(i) Form milling (ii) Angular milling (iii) Gang milling (10 Marks)

OR

- 10 a. Differentiate between open loop and closed loop systems. (06 Marks)
b. Define robot. Write down industrial applications of robot. (04 Marks)
c. Explain the components of CNC with a block diagram. (10 Marks)

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CBGS SCHEME

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Question Paper Version : A

First/Second Semester B.E Degree Examination, Dec.2018/Jan.2019

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 40

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the fourty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The word ecology is proposed by
a) Ernst Heckel b) Helena curtis c) Charles Southwick d) Charles Alton
 2. A food web consists of
a) a portion of food chain b) An organism position in food chain
c) Interlocking of food chain d) A set of similar consumers
 3. Population explosion will cause
a) Bio diversity b) Stress on ecosystem
c) More Employment d) None of these
 4. Which of the following statement is not true about animal husbandary?
a) it is a part of agricultural activity
b) It is breeding, feeding and management of animals
c) It is live stock production
d) It is protective of wild life.
 5. Fossils fuels largely consists of
a) Hydrocarbons
b) Hydrogen sulphide
c) Hydrochloric acid
d) Carbon dioxide.

6. The major contributors to the acid rain are known as
a) Precursors b) Processors c) Protons d) Pollutants
7. Percentage methane content of biogas is
a) 5.5 b) 85 c) 55 d) 0.55
8. Water used for irrigation of food crops fodder crops and medical herbs is known as
a) Consumptive use b) Commercial use
c) Productive use d) Auxiliary use
9. Environment (protection) Act was enacted in the year
a) 1986 b) 1992 c) 1984 d) 1974
10. Pesticide causes
a) eye irritation b) skin irritation
c) Respiratory ailments d) all of the above
11. Which of the following is not a renewable source of energy
a) Fossil fuel b) Solar energy c) Tidal wave energy d) Wind energy
12. Percentage of fresh water available below the earth is
a) 2.8% b) 2.2% c) 0.6% d) 2.15%
13. The quantity of solar energy received by the earth is
a) 5% b) 15% c) 99% d) 45%
14. Smog is combination of,
a) Smoking and Fog b) Snow and Fog c) Smoke and Snow d) All the above
15. Agricultural revolution began
a) 1000-2000 years ago b) 1 million years ago
c) 30,000 – 50,000 years ago d) 10,000 – 20,000 years ago
16. Environmental pollution is due to
a) Rapid urbanization b) Deforestation
c) Afforestation d) a and b, as above
17. What is maximum allowable concentration of fluorides in drinking water?
a) 1.0 mg/litre b) 1.25 mg/litre c) 1.50 mg/litre d) 1.75 mg/litre
18. Which pyramid is always upright?
a) Energy b) Biomass c) Numbers d) Food chain
19. The leader of chipko movement is
a) Sunderlal Bahuguna b) Medha Patkar
c) Vandana Shiva d) Suresh Heblkar

20. Bhopal Gas Tragedy was caused due to leakage of
a) Methyl iso cyanate (MIC) b) Sulphur dioxide
c) Mustard gas d) Methane
21. Each chlorine free radical can destroy the following number of ozone molecules
a) 1000 b) 10,000 c) 1,00,000 d) 100
22. In aquatic ecosystem phytoplankton can be considered as a
a) Consumer b) Producer
c) Saprotrophic organisms d) Macro consumer
23. The first international earth summit was held in
a) Johannesburg b) Kyoto c) Stockholm d) Riodejanerio
24. Ozone layer thickness is measured in
a) PPM b) PPb c) Decibels d) Dobson unit
25. The water (Prevention and control of pollution) Act was enacted in the year
a) 1986 b) 1974 c) 1994 d) 2004
26. Karnataka State Pollution Control Board (KSPCB) was established in the year.
a) 1947 b) 1982 c) 1986 d) 1976
27. Which state is having highest woman literacy rate in India?
a) Karnataka b) Punjab c) Rajasthan d) Kerala
28. Noise is measured in
a) Decibels b) Jouls c) PPM d) NTU
29. Excess nitrates in drinking water is likely to cause
a) Fluorosis b) Minamata
c) Blue baby syndrome d) None of these
30. The word 'Environment is derived from,
a) Greek b) French c) Spanish d) English
31. Forests prevent soil erosion by binding soil particles in their
a) Stems b) Roots c) Leaves d) Buds
32. Study trends in human population growth and prediction of future growth is called
a) Demography b) Biography c) Kalography d) Psychology
33. Large regional unit characterized by Flora and Fauna is
a) Biosphere b) Biome c) Ecosystem d) All of these
34. Environment means
a) Sum total of all condition b) A beautiful land scape
c) Industrial Production d) Air and water

35. Remote sensing is a
a) Satellite system b) Ground segments c) Sensor system d) All of these
36. Terrace forming is practiced in
a) Coastal areas b) Hills c) Deserts d) Plains
37. Who is the author of the book "Silent Spring"?
a) Robin cook b) Arthur Hailey c) Rachel carson d) Darwin
38. Geothermal energy is a
a) Heat energy b) Current energy c) Wind energy d) Solar energy
39. Which of the following is not a "green house gas"?
a) Oxygen b) Carbon dioxide c) Chlorofluro carbon d) Methane.
40. GIS can be expanded as
a) Geological information system b) Geographic information system
c) Geodynamic intimation system d) Geographic internet system

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CBCS SCHEME

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17ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing
ONE full question from each module.

Module-1

- 1 a. Explain the operation of PN junction diode under forward and reverse bias condition. (07 Marks)
- b. Discuss the load and line regulations using zener diode with neat circuit diagrams and appropriate expressions. (08 Marks)
- c. Design a 9V DC reference source consisting of a zener diode and series connected resistor to operate from a 24V supply. [$I_{ZT} = I_Z = 20 \text{ mA}$]. (05 Marks)

OR

- 2 a. With a neat circuit diagram, explain the operation of centre tapped full wave rectifier. Draw input and output waveforms. (07 Marks)
- b. Draw common emitter circuit, sketch input and output characteristics and explain three regions of operation. (08 Marks)
- c. Derive the relationship between α and β . Find I_C and I_E for the transistor with $\alpha = 0.99$ and $I_B = 20 \mu\text{A}$. (05 Marks)

Module-2

- 3 a. Precisely analyse the circuit of voltage divider bias. (08 Marks)
- b. What is Op-Amp? List out the ideal and particle characteristics of Op-Amp. (07 Marks)
- c. Calculate the output voltage of a summer. Given : $R_1 = 200\text{k}\Omega$, $R_2 = 250\text{k}\Omega$, $R_3 = 500\text{k}\Omega$. $R_f = 1\text{M}\Omega$, $V_1 = -2\text{V}$, $V_2 = -1\text{V}$ and $V_3 = +3\text{V}$. (05 Marks)

OR

- 4 a. Design a base bias circuit to have $V_{CE} = 5\text{V}$ $I_C = 5\text{mA}$. The supply voltage is 15V and transistor has $h_{FE} = 100$. (07 Marks)
- b. Derive an expression for the voltage gain of inverting and Non-inverting amplifier. (08 Marks)
- c. Analyse the circuit of an op-amp as an integrator. (05 Marks)

Module-3

- 5 a. Interpret the following :
 - i) $(48350)_{10} = ()_{16} = ()_8$
 - ii) $(FACE)_{16} = ()_2 = ()_8$
 - iii) $(847.951)_{10} = ()_8$. (06 Marks)
- b. Write the logical symbol, truth table and Boolean expressions of all the logic gates : (AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR). (09 Marks)
- c. Realize EX -OR gate using NAND gates only. (05 Marks)

OR

- 6 a. Which are the universal gates? Realize basic gates using universal gates? (07 Marks)
 b. Design a full adder using two half adder. Derive the necessary expressions. (08 Marks)
 c. Perform the subtraction using 2's complement method :
 i) $(11010)_2 - (10000)_2$
 ii) $(11)_{10} - (15)_{10}$. (05 Marks)

Module-4

- 7 a. With diagram and truth table explain NAND gate latch. (06 Marks)
 b. Explain the operation of 8051 microcontroller with neat block diagram. Mention the salient features. (10 Marks)
 c. Distinguish between flip-flop and latch. List out the applications of flip-flop. (04 Marks)

OR

- 8 a. Explain the operation of clocked RS flip-flop. (07 Marks)
 b. With a neat block diagram, explain microcontroller based stepper motor control system. (07 Marks)
 c. With a diagram and truth table, explain NOR Gate Latch. (06 Marks)

Module-5

- 9 a. What is modulation? Explain the need for modulation. (04 Marks)
 b. Derive the expression for frequency modulation with a neat waveforms. (10 Marks)
 c. Explain the piezoelectric and photo electric transducers. (06 Marks)

OR

- 10 a. Discuss the comparison between AM and FM modulation. (06 Marks)
 b. Explain the construction and principle of operation of LVDT. (07 Marks)
 c. A carrier of 1MHz , with 400 Watt of its power is amplitude modulated with a sinusoidal signal of 2500Hz . The depth of modulation 75%. Calculate the side band frequencies, the band width, the power in the side bands and the total power in the modulated wave. (07 Marks)

CBCS SCHEME

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15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1
- Draw and explain the V-I characteristics of a Silicon diode. (05 Marks)
 - Find the value of the series resistance 'R_S' required to drive a forward current of 1.25mA through a germanium diode from a 4.5V battery. Write the circuit diagram showing all the values. (04 Marks)
 - With circuit diagram, explain the operation of center-tapped full wave rectifier. Draw input and output waveforms. (07 Marks)

OR

- 2
- Design the Zener regulator for the following specifications. Output voltage = 5V, load current = 20mA, Zener voltage $P_{Z(\min)} = 500$ mW and input voltage = $12V \pm 3V$. (05 Marks)
 - Draw CE circuit and sketch the input and output characteristics also explain the operating regions by indicating them on the characteristics curve. (08 Marks)
 - Calculate the values of I_C and I_E for a BJT with $\alpha = 0.97$ and $I_B = 50 \mu A$. Also determine the value of β_{dc} . (03 Marks)

Module-2

- 3
- Determine the operating point for a Silicon transistor biased by base bias method, for $\beta = 100$, $R_C = 2.5k\Omega$, $R_B = 500k\Omega$ and $V_{CC} = 20V$. Also draw the DC load line. (06 Marks)
 - With a net circuit diagram. Explain the voltage divider bias circuit. (07 Marks)
 - Compare base bias and voltage divider bias circuits. (03 Marks)

OR

- 4
- List the characteristics of an ideal op-amp. (05 Marks)
 - A non-inverting amplifier has input resistance of $10k\Omega$ and feedback resistance of $60k\Omega$. With a load resistance of $47k\Omega$. Draw the circuit and calculate the output voltage, voltage gain, load current, when the input voltage is 1.5V. (06 Marks)
 - Derive the expression for 3-input summing amplifier. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Compare analog and digital signal. (04 Marks)
 b. Convert :
 i) $(1AD.EO)_{16} = (?)_{10} = (?)_8$
 ii) $(1101101)_2 = (?)_{10}$
 iii) $(69)_{10} = (?)_2$ (05 Marks)
 c. Perform the subtraction :
 i) $(10010)_2$ and (1101) using 1's complement method
 ii) $(10010)_2$ and $(01101)_2$ using 2's complement method. (07 Marks)

OR

- 6 a. State and prove DC – Morgan's theorems for 4 variables. (08 Marks)
 b. Simplify the following expression and realize using basic gates :
 $Y = A(\overline{ABC} + A\overline{BC})$. (04 Marks)
 c. Realize half adder using only NAND gate. (04 Marks)

Module-4

- 7 a. Define flip-flop. Give the difference between a later and flip-flop. (04 Marks)
 b. Explain the working of a NOR gate later. (06 Marks)
 c. With diagram and truth table explain clocked RS –flip-flop. (06 Marks)

OR

- 8 a. List the important features of 8051 microcontroller. (03 Marks)
 b. Explain the architecture of 8051 microcontroller. (07 Marks)
 c. With block diagram, explain the micro-controller based stepper motor control system. (06 Marks)

Module-5

- 9 a. With a neat block diagram, explain the elements of communication system. (06 Marks)
 b. A carrier of 1MHz, with 400W of its power is amplitude modulated with a sinusoidal signal of 2500Hz. The depth of modulation is 75%. Calculate the sideband frequencies, the band width, the power in the side bands and the total power in the modulated wave. (05 Marks)
 c. Give the comparison between AM and FM. (05 Marks)

OR

- 10 a. What is a Transducer? Distinguish between active and passive transducer. (05 Marks)
 b. A termistor has a material constant ' β ' of 2000° K. If its resistance is 100 k Ω at 300°k temperature, what will be the resistance at 500°k? (04 Marks)
 c. Explain the construction and the principle of operation of LVDT. Also list the advantages of LVDT. (07 Marks)

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14ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019
Basic Electronics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting ONE full question from each module.

Module – 1

1.
 - a. Define PN Junction. Draw and explain the VI characteristics of Si and Ge diodes. (05 Marks)
 - b. Derive an expression for ripple factor and dc o/p voltage of a half wave rectifier with C filter. (07 Marks)
 - c. Calculate the values of I_C , I_E and β_{dc} for a transistor with $\alpha_{dc} = 0.99$ and $I_B = 110\mu A$. (03 Marks)
 - d. With a neat circuit. Explain the working of clipping circuit. (05 Marks)
2.
 - a. Explain the working of center tapped Full Wave Rectifier (FWR) and derive the expression for I_{dc} , I_{rms} , r (06 Marks)
 - b. Draw and explain the clamper circuit with suitable waveforms. (05 Marks)
 - c. Derive the relationship between α and β and draw the input and output characteristics of common collector configuration. (04 Marks)
 - d. Design a zener diode voltage regulator to meet the following requirements unregulated dc I/P voltage, $V_i = 13$ to $17V$, $I_L = 10mA$, $V_0 = 10V$, $I_{zmin} = 5mA$, $P_{zmax} = 500mW$. (05 Marks)

Module – 2

3.
 - a. What are the ideal characteristics of opamp? (05 Marks)
 - b. Explain dc load line and Bias point with respect to common emitter configuration. (05 Marks)
 - c. Compute the output expression for V_o shown in Fig Q3(c)

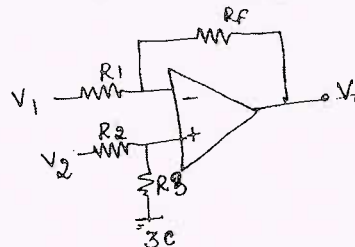


Fig Q3(c)

- d. Explain how opamp can be used as an inverting amplifier. (05 Marks)
4.
 - a. With waveform, explain how opamp can be used as differentiator and integrator. (06 Marks)
 - b. Explain the working of voltage divider bias circuit. (07 Marks)
 - c. Mention different region of operation of transistor. (03 Marks)
 - d. Explain the term with respect to opamp a) CMRR ii) Slew rate. (04 Marks)

Module – 3

5.
 - a. Implement EXOR gate using basic gates. (05 Marks)
 - b. Explain basic boolean laws. (05 Marks)
 - c. Determine the value of base x if
 - i) $(225)_x = (341)_8$ ii) $(211)_x = (152)_8$ (04 Marks)
 - d. Subtract $(28)_{10} - (19)_{10}$ using both 1's and 2's complement methods. (06 Marks)

- 6 a. State Demorgan's theorem for 3 variables and prove. (05 Marks)
 b. Design half adder circuit and realize using NAND gates. (05 Marks)
 c. Simplify and realize the following Boolean equation using basic gates

$$Y = ABC + \overline{A}BC + A\overline{B}C + \overline{A}\overline{B}C$$
 (05 Marks)
 d. $(110011)_2 - (11001)_2 = (?)_2$ using 2's complement method. (05 Marks)

Module – 4

- 7 a. Define Flip-flop. Explain the working of clocked RS FF with a suitable logic diagram and a truth table. (06 Marks)
 b. Explain the functional diagram of 8085 microprocessor. (09 Marks)
 c. Distinguish between active and passive transducers. (05 Marks)
- 8 a. With circuit. Explain the working of NAND gate Latch. (05 Marks)
 b. List the differences between microprocessor and microcontroller. (05 Marks)
 c. Explain the construction and working of Linear variable differential transducer. (05 Marks)
 d. Write a note on Piezo electric transducer. (05 Marks)

Module – 5

- 9 a. What is modulation? Explain the need for modulation. (05 Marks)
 b. With block diagram, explain the basic elements of communication system. (05 Marks)
 c. Mention the applications of OFC. (04 Marks)
 d. List the differences between AM and FM. (06 Marks)
- 10 a. Define amplitude modulation and prove that $P_t = P_c \left(1 + \frac{m^2}{2} \right)$ and write AM wave. (09 Marks)
 b. Explain the block diagram of ISDN. (06 Marks)
 c. The total power content of an AM signal is 2000W. Determine the power being transmitted at carrier frequency and at each of the side bands when percentage modulation is 100% (05 Marks)

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First/Second Semester B.E. Degree Examination, June/July 2019 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is single electrode potential? Derive Nernst's equation for single electrode potential. (06 Marks)
- b. What are batteries? Demonstrate the construction and working of Ni-MH battery. mention its applications. (07 Marks)
- c. What voltage will be generated by a cell that consists of an iron electrode immersed in 0.5M FeSO₄ solution and a copper electrode immersed in 1M CuSO₄ solution at 298 K. Given $E_{Fe}^{\circ} = -44 \text{ V}$ and $E_{Cu}^{\circ} = 0.34 \text{ V}$. Write the cell representation and cell reactions. (07 Marks)

OR

- 2 a. What is Battery? Explain primary and secondary with examples. (06 Marks)
- b. Describe the construction and working of Li-ion battery. Mention its applications. (07 Marks)
- c. What are concentration cells? Emf of the cell $Cd | CdSO_4 (XM) || CdSO_4 (0.025M) | Cd$ at 28°C is 0.035 V. Find the concentration of CdSO₄ at anode. Given $R = 8.314 \text{ J/K/mol}$. $F = 96500 \text{ C}$. (07 Marks)

Module-2

- 3 a. Discuss the following types of corrosion:
 - i) Differential metallic corrosion
 - ii) Water line corrosion(06 Marks)
- b. What is corrosion? Illustrate electrochemical theory of corrosion taking iron as an example. (07 Marks)
- c. What is electroless plating? Outline the electroless plating of copper. (07 Marks)

OR

- 4 a. Explain the factors affecting the rate of corrosion:
 - i) Nature of corrosion product
 - ii) Ratio of anodic to cathodic areas(06 Marks)
- b. What is meant by metal finishing? Highlight any five technological importance of metal finishing. (07 Marks)
- c. What is electroplating? Discuss the electroplating of chromium. (07 Marks)

Module-3

- 5 a. What are fuel cells? Describe the construction and working of Methanol-Oxygen fuel cell. (06 Marks)
- b. Describe the experimental determination of calorific value of solid fuel using Bomb Calorimeter. (07 Marks)
- c. 0.95 g of coal sample (C = 93%; H₂ = 6% and ash 1%) was subjected to combustion in Bomb calorimeter. Mass of water taken in the calorimeter was 2.6 kg and the water equivalent of calorimeter was 0.75 kg. The rise in temperature was found to be 3.2°C. Calculate the gross and net calorific values of the sample. Latent heat of steam = 2457 kJ/kg/°C and S = 4.187kJ/kg/°C. (07 Marks)

OR

- 6 a. Explain the preparation of solar grade silicon by union-carbide process. (06 Marks)
b. What are pv-cells? Illustrate the construction and working of a typical pv-cell. (07 Marks)
c. What is knocking? Explain the mechanisms of knocking. Mention its ill effects. (07 Marks)

Module-4

- 7 a. Outline the softening of water by ion-exchange method. (06 Marks)
b. What are the sources, effects and control of lead pollution? (07 Marks)
c. Define COD. In a COD test, 30.6 cm³ and 15.5 cm³ of 0.05N FAS solution are required for blank and sample titration respectively. The volume of the test sample used was 25 cm³. Solve the COD of the water sample solution. (07 Marks)

OR

- 8 a. What is Desalination? Describe the process of reverse osmosis of water. (06 Marks)
b. What is boiler corrosion? Explain the boiler corrosion with CO₂, O₂ and MgCl₂. (07 Marks)
c. Define COD. Illustrate the determination of COD of waste water sample. (07 Marks)

Module-5

- 9 a. Describe the synthesis of nano-material by sol-gel technique. (06 Marks)
b. Discuss the theory and instrumentation of conductometry. (07 Marks)
c. Outline the theory, instrumentation and applications of colorimetry. (07 Marks)

OR

- 10 a. Explain size dependent properties of nano material:
i) Surface area
ii) Electrical
iii) Optical properties (06 Marks)
b. Write a note on fullerenes. Mention its properties and applications. (07 Marks)
c. What are nanomaterials? Explain the synthesis of nanomaterial by chemical vapour deposition method. (07 Marks)

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First/Second Semester B.E. Degree Examination, June/July 2019 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is single electrode potential? Obtain an expression for the same. (07 Marks)
- b. What are reference electrodes? Explain the construction and working of Calomel electrode. (07 Marks)
- c. Write a note on following battery characteristics:
(i) Capacity (ii) Current (iii) Shelf life (06 Marks)

OR

- 2 a. What are batteries? Explain the construction and working of Li-MnO₂ battery. Mention its applications. (07 Marks)
- b. Explain the construction and application of CH₃OH-O₂ fuel cell. Mention its applications. (07 Marks)
- c. The cell potential of Cu concentration cell Cu | Cu²⁺ (0.0093 M) || CuSO₄(X) | Cu is 0.086 V at 25°C. Write cell reaction and calculate the value of 'X'. (06 Marks)

Module-2

- 3 a. What is corrosion? Explain the resting of Iron by using electrochemical theory. (07 Marks)
- b. What is cathodic protection? Explain sacrificial anodic method and impressed current method. (07 Marks)
- c. What is metal finishing? Explain the following :
(i) Polarization (ii) Over voltage. (06 Marks)

OR

- 4 a. Discuss the effect of following on nature of electrodeposit:
(i) Current density (ii) pH (iii) Temperature. (07 Marks)
- b. Explain the electroplating of Nickel. (07 Marks)
- c. Write a note on the following :
(i) Galvanic corrosion (ii) Concentration cell corrosion (water line and pitting). (06 Marks)

Module-3

- 5 a. What is calorific value? Explain the experimental determination of calorific value of fuel by using Bomb calorimeter. (07 Marks)
- b. Calculate the gross and net calorific value of a coal sample from the following data obtained from Bomb-calorimeter experiment:
(i) Weight of coal = 0.73 g, (ii) Weight of water taken in calorimeter = 1500 g.
(iii) Water equivalent of calorimeter = 470 g (iv) Initial temperature = 25.0°C (v) Final temperature = 27.3°C (vi) % of H₂ in coal = 2.5% (vii) Latent heat of steam = 587 cal g⁻¹. (07 Marks)
- c. Explain the production of solar grade Si by union carbide process. (06 Marks)

OR

- 6 a. Explain the construction and working of typical P.V. cell. (07 Marks)
 b. What are solar cells? Explain the modules panels and arrays. (07 Marks)
 c. Explain the fluidized bed catalytic cracking process. (06 Marks)

Module-4

- 7 a. What are polymers? Explain the addition polymerization mechanism by taking Vinyl Chloride as example (07 Marks)
 b. What is glass transition temperature? Explain the factors affecting T_g value. (07 Marks)
 c. Explain the synthesis of
 (i) Plexi glass (ii) Epoxy resin. (06 Marks)

OR

- 8 a. What are elastomers? Explain the synthesis and applications of Silicone rubbers. (07 Marks)
 b. What are conductivity polymers? Write the mechanism of polyaniline. (07 Marks)
 c. Calculate the $\bar{\mu}_n$ and $\bar{\mu}_w$ for a polymer sample consisting of 10% by weight of macromolecules of molecular weight 10,000 and 90% by weight of molecules with molecular weight 100000. $M_1 = 10$, $M_2 = 90$. (06 Marks)

Module-5

- 9 a. What is boiler feed water? Explain the scale and sludge formation in boiler. (07 Marks)
 b. 25 ml of waste water was mixed with 10 ml of $K_2Cr_2O_7$, acidified and refluxed. The unreacted $K_2Cr_2O_7$ acidified required 15.2 ml of 0.3N FAS. In blank titration 10ml of $K_2Cr_2O_7$ acidified required 19.4 ml of same 0.3N FAS. Calculate COD of waste water. (07 Marks)
 c. Write a note on Fullerenes. Mention its applications. (06 Marks)

OR

- 10 a. What are nano materials? Explain the synthesis of nanomaterials by Sol-gel method. (07 Marks)
 b. Write note on the following :
 (i) Carbon nanotubes (ii) Dendrimers (06 Marks)
 c. What is desalination? Explain desalination of water by electro dialysis. (07 Marks)

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15CHE12/22

First/Second Semester B.E. Degree Examination, June/July 2019 Engineering Chemistry

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is single electrode potential? Derive the Nernst equation for single electrode potential. (06 Marks)
- b. Define Electrolyte Concentration Cell. Two copper electrodes placed in CuSO_4 solutions of equal concentration are connected to form a concentration cell :
- i) What is the Cell Voltage?
- ii) If one of the solutions is diluted until the concentration of Cu^{2+} ions is $1/5^{\text{th}}$ of its original value, what will be the cell voltage after dilution? (05 Marks)
- c. Describe the construction, reactions and applications of Nickel metalhydride battery. (05 Marks)

OR

- 2 a. Describe the following battery characteristics :
- i) Voltage ii) Capacity iii) Cycle life. (06 Marks)
- b. Explain the construction and working of Calomel electrode. (05 Marks)
- c. Describe the construction, electrode reactions and applications of Methanol – oxygen fuel cell. (05 Marks)

Module-2

- 3 a. Explain the effects of following variables on the nature of electro deposit :
- i) Current density ii) Metal ion concentration iii) Complexing agents. (06 Marks)
- b. Explain the Electrochemical theory of corrosion with iron as an example. (05 Marks)
- c. Describe the Cathodic protection by Sacrificial Anode Method. (05 Marks)

OR

- 4 a. Describe the effects of following factors on the rate of corrosion :
- i) Nature of metal ii) Nature of corrosion products iii) Difference in potential between anodic and cathodic regions. (06 Marks)
- b. Define Electroless plating. Explain the Electroless plating of copper. (05 Marks)
- c. Describe Electro deposition of Hard Chromium. (05 Marks)

Module-3

- 5 a. Explain how calorific value of a solid fuel is determined using Bomb Calorimeter. (06 Marks)
- b. Explain the purification of silicon by zone refining process. (05 Marks)
- c. A 0.85g of coal sample (carbon 90%, H_2 5% and ash 5%) was subjected to combustion in a bomb calorimeter. Mass of water taken in the calorimeter was 2000g and the water equivalent of calorimeter was 600g. The rise in temperature was 3.5°C . Calculate the gross and net calorific value of the sample. Given, specific heat of water = $4.187 \text{ kJ/kg}^{\circ}\text{C}$ and latent heat of steam 2454 kJ/kg . (05 Marks)

OR

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- a. What is Photovoltaic cell? Explain the construction and working of PV cell. (06 Marks)
6 b. Describe Fluidized bed catalytic cracking. (05 Marks)
c. Explain the process of doping of silicon by diffusion technique. (05 Marks)

Module-4

- 7 a. Mention the preparation and applications of Poly methyl Methacrylate (PMMA) and poly carbonate. (06 Marks)
b. Define Glass transition temperature. Explain the following factors influencing the T_g value.
i) Flexibility ii) Intermolecular forces. (05 Marks)
c. Explain the free radical mechanism of addition polymerization by taking vinyl chloride as an example. (05 Marks)

OR

- 8 a. What is Conducting polymer? Explain the synthesis of conducting polyaniline. (06 Marks)
b. Define Adhesive. Explain the preparation and applications of Epoxy resin. (05 Marks)
c. A polymer has following composition, 100 molecules of molecular mass 1000g/mol, 200 molecules of molecular mass 2000g/mol and 500 molecules of molecular mass 5000g/mol. Calculate the number and weight average molecular weight. (05 Marks)

Module-5

- 9 a. Explain Winkler's method of determining dissolved oxygen. Give the reactions involved. (06 Marks)
b. Define COD. 25cm³ of an industrial effluent requires 12.5cm³ 0.5N K₂Cr₂O₇ for the complete oxidation. Calculate COD of the sample. Assuming that the effluent contains only oxalic acid. Calculate the amount of oxalic acid present in 1 dm³ (Eq.wt of oxalic acid = 45). (05 Marks)
c. Write a note on Dendrimer. (05 Marks)

OR

- 10 a. Explain the Synthesis of nano materials by Chemical vapour condensation and precipitate methods. (06 Marks)
b. Write a note on Carbon nanotubes. (05 Marks)
c. Explain the desalination of water by electro - dialysis. (05 Marks)

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First/Second Semester B.E. Degree Examination, June/July 2019
Engineering Chemistry

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE questions, selecting ONE full question from each part.

PART – A

- 1 a. What are reference electrodes? Discuss the construction and working of Calomel electrode. (06 Marks)
- b. What are concentration cells? Derive an expression for the emf of a concentration cell. (04 Marks)
- c. Explain any two characteristics of a battery. (04 Marks)
- d. What are fuel cells? Discuss the construction and working of methanol – oxygen fuel cell with H₂SO₄ electrolyte. (06 Marks)
- 2 a. Derive Nernst equation for electrode potential. (05 Marks)
- b. A concentration cell is constructed by immersing 2 Fe electrodes in 0.01 M and 0.1 M FeSO₄ solution. Represent the cell and calculate the emf of the cell at 298 K. (05 Marks)
- c. Discuss the construction and working of nickel metal hydride battery and give its applications. (05 Marks)
- d. Discuss the construction and working of lithium ion cobalt oxide battery. (05 Marks)

PART – B

- 3 a. What is corrosion? Explain the electrochemical theory of corrosion taking iron as an example. (06 Marks)
- b. Explain the following factors which affects the rate of corrosion : (i) nature of the metal (ii) ratio of anodic to cathodic area. (04 Marks)
- c. Discuss the electroplating of hard chromium and mention its applications. (05 Marks)
- d. What is electroless plating? Mention the difference between electroplating and electroless plating. (05 Marks)
- 4 a. Discuss (i) galvanization and (ii) sacrificial method of cathodic protection. (06 Marks)
- b. Discuss (i) differential metal and (ii) stress corrosions. (04 Marks)
- c. Explain the electroplating of gold using acidic cyanide bath. (05 Marks)
- d. Discuss decomposition potential and overvoltage. (05 Marks)

PART – C

- 5 a. Explain the determination of calorific value of a solid fuel using bomb calorimeter. (05 Marks)
- b. Explain the process of knocking in diesel engines. (05 Marks)
- c. What is reforming of petrol? Give the reactions involved in it. (05 Marks)
- d. What are photovoltaic cells? Discuss the construction and working of PV cell. (05 Marks)

- 6 a. On burning 0.83 gm of a solid fuel in a bomb calorimeter, the temperature of 3500 gms of water increased from 25.5°C to 29.2°C. Water equivalent of calorimeter is 385 gms. Calculate the gross and net calorific values of the fuel if the percentage of hydrogen is 0.7%. (Given : Specific heat of water = 4.187 kJ/kg/K ; Latent heat of condensation of steam = 2458 kJ/kg). (05 Marks)
- b. Explain the mechanism of knocking in petrol engines. (05 Marks)
- c. Explain fluidized bed catalytic cracking of heavy oil. (05 Marks)
- d. Describe the method for production of solar grade silicon by union carbide method. (05 Marks)

PART – D

- 7 a. Explain the free radical mechanism of polymerization taking vinyl chloride as an example. (05 Marks)
- b. Explain any three structure – property relationship of a polymer. (05 Marks)
- c. What are conducting polymers? Explain the mechanism of conduction in polyaniline. (05 Marks)
- d. Write the synthesis and applications of Teflon and Plexi glass. (05 Marks)
- 8 a. A polymer sample contains 5 molecules having a molecular weight of 2000, 4 molecules having molecular weight of 3000 and 3 with molecular weight of 4000. Calculate number average and weight average molecular weight. (04 Marks)
- b. What is glass transition temperature? Explain any three factors influencing the glass transition temperatures. (06 Marks)
- c. What are elastomers? Explain the synthesis and uses of silicone rubber. (05 Marks)
- d. What are polymer composites? Explain the synthesis of Kevlar fibre. (05 Marks)

PART – E

- 9 a. What is boiler corrosion? Explain corrosion of boiler due to O₂, CO₂ and MgCl₂. (04 Marks)
- b. Define COD. Explain experimental determination of COD of sewage water. (06 Marks)
- c. How do you synthesize nanomaterial by hydrothermal and precipitation methods. (05 Marks)
- d. Write a note on dendrimers. (05 Marks)
- 10 a. What is desalination? Explain the reverse osmosis method of desalination. (05 Marks)
- b. Calculate COD of an effluent sample when 25 ml of the effluent required 8.3 ml of 0.001 M K₂Cr₂O₇ for oxidation. (05 Marks)
- c. Write a note on fullerene. (05 Marks)
- d. Explain the synthesis of nanomaterial by sol-gel process. (05 Marks)

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18CPS13/23

First/Second Semester B.E. Degree Examination, June/July 2019 C Programming for Problem Solving

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat block diagram of computer, explain its components. (10 Marks)
- b. Classify the following into input and output devices:
Monitors, visual display unit, Track balls, Bar code reader, Digital camera, Film recorder, Microfiche, OMR, Electronic Whiteboard, Plotters. (05 Marks)
- c. Define the terms: Network, LAN, WAN, MAN and network topology. (05 Marks)

OR

- 2 a. Write the basic structure of C program. Explain each section briefly with suitable example. (09 Marks)
- b. Define operator. Explain any 6 operators with suitable example. (07 Marks)
- c. State whether the following are valid identifiers or not: integer, float, I am, 123_AbC. (04 Marks)

Module-2

- 3 a. Define and write the classification of Input and Output statements in C. Write a C-program that prints the following output:

```

" I am
an"      'Engineering
Student'
```

Screen →

- b. Define branching statements. Explain them with syntax and suitable example. (06 Marks)
- c. Evaluate:

```
i = 1
L : if (i > 2)
{
    printf ("Saturday");
    i = i + 1;
    goto L;
}
printf ("Sunday");
```

Explain your result briefly. (04 Marks)

OR

- 4 a. State the drawback of ladder if-else. Explain how do you resolve with suitable example. (08 Marks)
- b. Write a C program to get the triangle of numbers as a result:

```

1
1 2
1 2 3
1 2 3 4
```

(06 Marks)
- c. Write a C program to check whether given number is prime or not. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Define an array. Explain with suitable example how do you declare and initialize 1D array. (10 Marks)
b. Write a C program to search an element using linear and binary techniques. (10 Marks)

OR

- 6 a. Define a string. Explain any 4 string library functions with syntax and example. (10 Marks)
b. Write a C program to copy a string (combination of digits and alphabets) to another string (only alphabets). (10 Marks)

Module-4

- 7 a. Define a function. List and explain the categories of user defined functions. (10 Marks)
b. Write a C-program for evaluating the binomial coefficient using a function Factorial (n). (10 Marks)

OR

- 8 a. Define a recursion. Write a C recursive function for multiplying two integers where a function call is passed with two integers m and n. (10 Marks)
b. Differentiate: (i) User defined and built-in function (ii) Recursion and iteration (10 Marks)

Module-5

- 9 a. Define structures. Explain how do you declare, initialize and represent the memory for structure variable. (10 Marks)
b. Write a C program that accepts a structure variable as a parameters to a function from a function call. (10 Marks)

OR

- 10 a. Define pointers. Explain pass by value and pass by reference with C statements and an example. (10 Marks)
b. Define pre-processor directives. Write C program that finds the addition of two squared numbers, by defining macro for Square (x). (10 Marks)

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CBCS SCHEME

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17PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2019

Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Design a general structure of C program and explain with an example. (06 Marks)
- b. What are Identifiers? Define rules to declare an identifier. Identify the following words are valid / Invalid Identifier : i) asd123 ii) auto iii) 2K18 iv) @india. (06 Marks)
- c. Design a flow chart and develop a C – program to find area of a circle for the given radius. (08 Marks)

OR

- 2 a. Explain the formatted input and output statements in C with suitable examples. (06 Marks)
- b. With example, explain Implicit and Explicit type conversion and convert the following Mathematical Expression to C – equivalent Expression.
i) $\text{area} = \sqrt{S(s-a)(s-b)(s-c)}$ ii) $\frac{x}{a+b} + \frac{y}{a-b}$. (08 Marks)
- c. Write a C program to find largest of three numbers using ternary operator. (06 Marks)

Module-2

- 3 a. Explain the following selection statements with syntax and flow chart :
i) nested if ii) else – if ladder. (06 Marks)
- b. With example bring out the differences between while loop and do – while loop. (06 Marks)
- c. Design a C program to perform operations of a simple calculator using switch statement. Provide a provision to display an error message when an attempt is made to divide a number by zero. (08 Marks)

OR

- 4 a. Explain the working of for loop and write a C – program to find n – Fibonacci series, where n is specified by the user. (08 Marks)
- b. Explain the following unconditional statements with syntax and example :
i) goto ii) continue. (06 Marks)
- c. Design a C – program to read a Four – digit number from user and calculate the reverse of the number and check if the number is palindrome or not. (06 Marks)

Module-3

- 5 a. Define Array. Explain the methods of initializing one dimensional array with suitable examples. (06 Marks)
- b. What are Functions? Explain the following terms with example.
i) Function declaration ii) Function definition iii) Function call. (08 Marks)
- c. What is Recursion? Write a C program to find factorial of the given number using recursion. (06 Marks)

OR

- 6 a. Explain the String Manipulation Functions with syntax and code fragments.
i) strlen ii) strcmp. (06 Marks)
- b. With example explain different type of Functions based in parameters. (08 Marks)
- c. Write a C – Function to search an element in the given array using Linear search by passing array as an argument. (06 Marks)

Module-4

- 7 a. What is Structure? Explain the methods of declaration and initialization of structures with example. (06 Marks)
- b. Write a C – program to maintain record of n employee details using array of structures with three fields (id, name, salary) and print details of employee whose salary is greater than 5000. (08 Marks)
- c. What is a file? Explain fopen and fclose functions. (06 Marks)

OR

- 8 a. Explain the following file operations with example :
i) fprintf() ii) fseek() iii) fputc(). (06 Marks)
- b. Explain Structure within a structure with example. (08 Marks)
- c. Given a file “n.txt” which contains names. Write a C – program to create a new file “abc.txt” and copy the contents from “n.txt” to “abc.txt”. (06 Marks)

Module-5

- 9 a. What are Pointers? How pointer variables are declared and initialized. (06 Marks)
- b. Explain the concept of adding and deleting nodes in the linked list. (07 Marks)
- c. Develop a C program to swap two numbers using pointers. (07 Marks)

OR

- 10 a. Explain different dynamic memory allocation schemes in C with example. (08 Marks)
- b. Explain any three preprocessor directives with example. (06 Marks)
- c. What is a Stack? Explain the operations on stack. (06 Marks)

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CBCS SCHEME

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First/Second Semester B.E. Degree Examination, June/July 2019 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Write a general structure of C program. Explain with example. (06 Marks)
- b. List basic data types in C. Write the significance of each data type. (04 Marks)
- c. What is Variable? Explain the syntax of variable declaration and variable initialization. (06 Marks)

OR

- 2 a. With syntax and example, explain the formatted and unformatted input and output functions in C. (06 Marks)
- b. Write a C program to convert temperature from degree centigrade to Fahrenheit. (04 Marks)
- c. Explain various operators supported by C. (06 Marks)

Module-2

- 3 a. Explain the syntax of for loop and write a program using for loop to find sum of first n natural numbers. (08 Marks)
- b. Explain the syntax of if statement and write a program to find largest of 3 numbers using if statement. (08 Marks)

OR

- 4 a. With example, explain the syntax of switch statement. (06 Marks)
- b. Explain Break and Continue statements. (04 Marks)
- c. Differentiate between while and do – while loops. (06 Marks)

Module-3

- 5 a. Explain declaration and initialization of two dimensional array and write a program to multiply two matrices. (10 Marks)
- b. What is function? Explain the differences between call by value and call by reference. (06 Marks)

OR

- 6 a. Explain the various string manipulation functions. (06 Marks)
- b. Write a C program to find factorial of a number using recursion. (04 Marks)
- c. Explain with example syntax of puts and gets functions. (06 Marks)

Module-4

- 7 a. What is File? Explain any five file manipulation functions with example. (08 Marks)
- b. Write a C program to maintain record of n students with appropriate fields and print the marks of student if name is entered. (08 Marks)

OR

- 8 a. What is Structure? Explain the syntax of structure declaration. Explain structure within structure with an example. (08 Marks)
b. Write a C program to read text from file and display it on screen. (08 Marks)

Module-5

- 9 a. What is Stack? Explain various stack operations. (08 Marks)
b. What is Pointer? Write a C program to swap two numbers using pointers. (08 Marks)

OR

- 10 a. What is Dynamic Memory Allocation? Explain the four functions for memory management. (08 Marks)
b. Explain various Pre processor directives. (08 Marks)

First/Second Semester B.E. Degree Examination, June/July 2019
Programming in C and Data structures

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least ONE question from each part.**

Module – 1

- 1 a. Mention the types of input and output statements. Explain any two with example. (06 Marks)
- b. Mention types of operators based on the number of operands? Explain logical operators with example. (09 Marks)
- c. Evaluate the following expressions where $i = 3, j = 4, k = 2$:
 i) $i++-j--$
 ii) $++K%-j$ iii) $j+1/i-1$ iv) $j++/i--$ v) $++i/++j+1$ (05 Marks)
- 2 a. Mention the types of expressions. Explain with example. (06 Marks)
- b. Write a program in C to find the area of rectangle, triangle and circle. (06 Marks)
- c. Explain the steps of a C program. Explain each step. (08 Marks)

Module – 2

- 3 a. Mention the types of conditional branch statements. Explain else-if ladder with syntax and example. (08 Marks)
- b. Write a program in C to display color names depending on the code using switch statement. (08 Marks)
- c. Differentiate between while and do-while. (04 Marks)
- 4 a. Explain break, continue and exit statements with syntax and example. (08 Marks)
- b. Write a program in C to display multiplication table upto n number. (06 Marks)
- c. What is a loop? Why it is required? Explain. (06 Marks)

Module – 3

- 5 a. What is an array? Mention the types of array. Explain how it is declared, read and printed. (08 Marks)
- b. Explain any four string handling functions. (08 Marks)
- c. Write a program in C to find the factorial of a number using recursion. (04 Marks)
- 6 a. What is a string? Explain how it is declared, read and printed. (08 Marks)
- b. Write a program in C to find the transpose of a matrix. (06 Marks)
- c. What is a function? Mention types of functions. Explain any one with example. (06 Marks)

Module – 4

- 7 a. Explain array of structures with an example. (06 Marks)
- b. What is a file? Explain file mode operations. (06 Marks)
- c. Write a program in C to create a structure of employee with name, Ecode, dept and org as data members and using this structure read and write five employee information. (08 Marks)
- 8 a. Compare array with structure. What are the advantages of structure over array with an example? (08 Marks)
- b. Write the advantages of files. (04 Marks)
- c. Write a program to create a file to read and print 100 students information. (08 Marks)

Module – 5

- 9 a. Mention the types of data structure. Explain any two. (08 Marks)
- b. Explain the applications of stack and linked list. (08 Marks)
- c. What is a pointer? Write the advantages of pointers. (04 Marks)
- 10 a. Mention the types of preprocessors. Explain any two preprocessors. (06 Marks)
- b. What is dynamic memory allocation? Explain the functions of memory allocation. (06 Marks)
- c. Write a program in C to add n numbers using a pointer. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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First/Second Semester B.E Degree Examination, June/July 2019
Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the fifty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The Constituent assembly which had been elected for undivided India held its first meeting in
a) January 1948 b) December 1946 c) November 1945 d) July 1947
 2. The following word has been added to the Preamble by 42nd Constitution Amendment Act.
a) Republic b) Fraternity c) Secular d) Sovereign
 3. The minimum age to become eligible for the office of the Governor is
a) 50 years b) 45 years c) 35 years d) 60 years
 4. The Election Commission of India does not conduct elections to the
a) Parliament b) Speaker of Lok Sabha
c) State Legislatures d) Office of the Vice-President
 5. Traffic in human being means
a) Transporting human beings b) Traffic in places having dense population
c) Illegal sale of human organ d) Buying and selling men and women
 6. The Constitution of India classifies the fundamental rights under
a) 6 heads b) 8 heads c) 7 heads d) 5 heads
 7. The total number of members in the state Legislative Council should not be less than
a) 40 b) 50 c) 60 d) 100
 8. To declare National Emergency a decision must be taken by the
a) Prime Minister b) Speaker of Lok Sabha
c) Chief Justice of India d) Union Cabinet

9. "Creamy Layer" in backward classes means,
a) Highly educated persons b) Persons holding high posts
c) Highly cultured persons d) Persons having higher incomes
10. Collective responsibility of the Union Cabinet means, all Ministers are collectively responsible to the
a) Prime minister b) President c) Lok sabha d) Parliament
11. The Directive Principles of State Policy are
a) Social Rights b) Political rights
c) Constitutional Rights d) Legal Rights
12. This is not a Fundamental Duty
a) To develop scientific temper
b) Not to indulge in corrupt practices
c) To respect National Flag and the National Anthem
d) To abide by the constitution
13. High Court Judges are appointed by the
a) Prime Minister b) President
c) Chief Justice of India d) Union Law Minister
14. Writ of Mandamus can be issued on the ground of
a) Unlawful detention b) Unlawful occupation of public office
c) Non-performance of public duties d) All of these
15. Under which of the following Articles, the procedure for amending the Indian Constitution is detailed?
a) Article 360 b) Article 356
c) Article 365 d) Article 368
16. It is not the objective enshrined in the Preamble to
a) Secure shelter and livelihood to all b) Equality of status
c) Liberty of thought and expression d) social, economic and political justice
17. The Vice-President of India is elected by the
a) Members of Lok sabha
b) Members of Rajya sabha
c) Members of both Lok sabha and Rajya sabha
d) Members of Lok sabha and all state Legislative Assemblies
18. At present, the number of members in Election Commission of India including the Chairman is
a) 3 b) 4 c) 5 d) 6
19. What is the maximum percentage of jobs that can be reserved by a state for other backward classes (OBC) people (other than SC and ST) in the Government jobs?
a) 25% b) 27% c) 30% d) 35%

20. While proclamation of National Emergency is in operation, the President cannot suspend following Fundamental Rights.
 a) Article 14 and Article 15
 b) Article 14 and Article 16
 c) Article 20 and Article 21
 d) Article 32
21. The minimum age to contest the election of a State Legislative Assembly is
 a) 30 years
 b) 21 years
 c) 35 years
 d) 25 years
22. Oath of office and secrecy is administered to the President of India before entering upon his office by
 a) Speaker of Lok Sabha
 b) Prime Minister
 c) Chief Justice of India
 d) Vice-President
23. Chief Justice of India holds the office until he attains the age of
 a) 58 years
 b) 60 years
 c) 65 years
 d) 70 years
24. "Mandal Commission" appointed in 1978 deals with
 a) Laws relating to sexual harassment
 b) Reservation for backward classes people
 c) rights of the minorities
 d) Laws relating to child labour
25. An arrested person by the police personnel should be allowed to
 a) contact his relative
 b) consult his Lawyer
 c) contact higher police officer
 d) contact magistrate
26. Article 21A – Right to Education as a Fundamental Right has been added by
 a) 74th Constitution Amendment Act
 b) 76th Constitution Amendment Act
 c) 86th Constitution Amendment Act
 d) 91th Constitution Amendment Act
27. The Governor of a state may resign his office by writing to
 a) The chief Justice of India
 b) The Chief Minister of the State
 c) Prime Minister
 d) President
28. Under the Indian Constitution, the subjects of administration have been divided into
 a) Two lists
 b) Three lists
 c) Four lists
 d) Five lists
29. The Prime Minister is the link between
 a) The President and Union Council of Ministers
 b) The President and both houses of the Parliament
 c) The Legislature and the Executive
 d) India and Foreign States
30. Which of the following confers upon the citizens, the right to approach a Court of Law for the protection and restoration of fundamental rights?
 a) Right to equality
 b) Right to liberty
 c) Right to Constitutional remedy
 d) Right against exploitation
31. The Fundamental Duties incorporated in our Constitution under Part IV – A are based on the
 a) German Constitution
 b) Russian Constitution
 c) Constitution of Ireland
 d) U.S.A. Constitution

44. Protection of the expression of ideas, but not the ideas themselves is called
a) Patent b) Forging c) Copy right d) Plagiarism
45. Fault tree is used
a) To assess the risk
b) In engineering testing
c) To assess the accuracy of the research work
d) To trace the fault in engineering work
46. Using the trade secrets of a former employer amounts to
a) Self deception b) Self dishonesty
c) Plagiarism d) Misusing the truth
47. This is not dishonesty in science and engineering
a) Forging b) Blending c) Trimming d) Cooking
48. As applied to responsibility, attitude of avoiding blame or being safe is the prime concern in
a) Reasonable care b) Minimalist approach
c) Good works views d) All of these
49. These are not trade secrets
a) Principles b) Formulas c) Devices d) Patterns
50. The owner of Patent right retains his patent right for _____ years from the date of filing.
a) 10 b) 15 c) 20 d) 50

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18ELN14/24

First/Second Semester B.E. Degree Examination, June/July 2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is semiconductor diode? Explain the different equivalent circuits of diode. (06 Marks)
- b. Explain the working of photodiode. (05 Marks)
- c. With a neat circuit diagram and waveforms, explain the working of full wave bridge rectifier. Also derive V_{dc} and V_{rms} values for full wave rectifier. (09 Marks)

OR

- 2 a. A full wave rectifier uses 2 diodes having internal resistance of 20Ω each. The transformer rms secondary voltage from centre to each end is 50V. Find I_m , I_{dc} , I_{rms} and V_{dc} if the load is 980Ω (06 Marks)
- b. Explain the functional block diagram of $78\times\times$ series voltage regulator. (06 Marks)
- c. Explain how Zener diode can be used as a voltage regulator. Give detail mathematical analysis. (08 Marks)

Module-2

- 3 a. With a neat circuit diagram explain the working of CMOS inverter. (06 Marks)
- b. For a N-channel JFET if $I_{DSS} = 8mA$ and $V_p = -5V$, calculate I_D at $V_{as} = -3V$ and V_{as} at $I_D = 3mA$. (05 Marks)
- c. Explain the construction, working and characteristics of N- channel JFET. (09 Marks)

OR

- 4 a. Explain the working of SCR using two transistor model. (06 Marks)
- b. What is commutation in SCR? Explain two types of commutation. (05 Marks)
- c. Explain the construction, working and characteristics of enhancement type MOSFET. (09 Marks)

Module-3

- 5 a. What is Op – AMP? List the characteristics of ideal Op – Amp. (06 Marks)
- b. Explain how Op – Amp can be used as i) Integrator ii) Voltage Follower. (08 Marks)
- c. Find the output of the Op – Amp circuit shown in Fig Q5(c) below

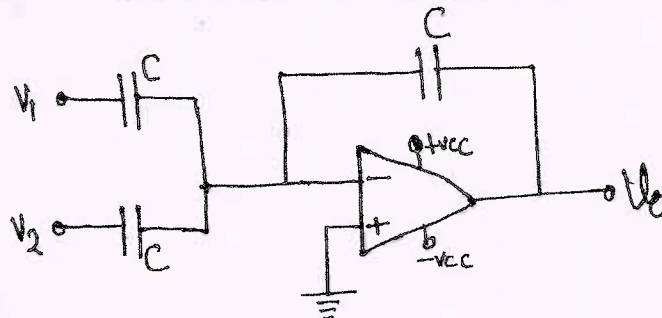


Fig Q5(c)

(06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revcaling of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain the following terms with respect to Op – Amp
 i) CMRR ii) Slew Rate iii) Output offset voltage iv) Supply voltage Rejection Ratio. (08 Marks)
- b. Design on Op – Amp circuit to obtain output expression as $V_0 = - [V_1 + 3V_2 + 5V_3]$. (06 Marks)
- c. Explain how Op – Amp can be used as differentiator. (06 Marks)

Module-4

- 7 a. What is feedback amplifier? What are the properties of negative feedback amplifier? (06 Marks)
- b. Explain how transistor can be used as an amplifier. (06 Marks)
- c. With a neat circuit diagram and waveforms, explain the working of 555 timers as an oscillator. (08 Marks)

OR

- 8 a. Draw the block diagram of voltage series negative feedback amplifier and derive the expression for its voltage gain. (06 Marks)
- b. Design a RC phase shift oscillator for a frequency of 1KHz. Draw the circuit diagram with designed values. (06 Marks)
- c. With a neat circuit diagram, explain the working of Wein Bridge oscillator. (08 Marks)

Module-5

- 9 a. Perform the following :
 i) Convert $(925.75)_{10}$ to base – 2 and base - 16
 ii) Subtract from $(11011.11)_2$ from $(10101.11)_2$ using 2's compliment method. (06 Marks)
- b. With a block diagram explain the working of 3-bit asynchronous counter. (06 Marks)
- c. What is multiplexer? Implement 8:1 multiplexer using basic gates. (08 Marks)

OR

- 10 a. Simplify $S = A \oplus B \oplus C$ and realize using basic gates. (05 Marks)
- b. What is flip-flop? Explain the operation of master slave JK flip flop. (06 Marks)
- c. Implement full adder using two half adders. (04 Marks)
- d. With a block diagram, explain the working of basic communication system. (05 Marks)

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17ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is PN junction diode? With the help of circuit diagram, explain the VI characteristics of a diode. (07 Marks)
- b. What is rectifier circuit? Explain the classification of the rectifier. Derive the following expressions for Half-wave rectifier: (i) I_{dc} (ii) I_{rms} (iii) η (iv) γ (08 Marks)
- c. Design a Zener diode voltage regulator circuit to meet the following specifications: $I_L = 20 \text{ mA}$, $V_o = 5\text{V}$, $P_z = 500 \text{ mW}$, $V_i = 12 \pm 2\text{V}$ and $I_{zmin} = 8 \text{ mA}$. (05 Marks)

OR

- 2 a. What is a transistor? What are its applications? Explain the various current gains in a transistor and derive the relation between α and β . (07 Marks)
- b. With a neat circuit diagram, explain the input and output characteristics of the common emitter configuration. (08 Marks)
- c. Explain the operation of full wave rectifier with capacitor filter. (05 Marks)

Module-2

- 3 a. For the base bias circuit, $V_{CC} = 18\text{V}$, $R_C = 2.2 \text{ K}\Omega$, $R_B = 470 \text{ K}\Omega$ and $\beta = 100$. Find I_B , I_C and V_{CE} . Draw the DC load line and locate the operating point. (07 Marks)
- b. Draw the circuit diagram of the voltage divider biasing circuit. Derive the expressions of I_B and V_{CE} . (05 Marks)
- c. List out the various ideal op-amp characteristics. Explain the terms CMRR and Slew rate. (08 Marks)

OR

- 4 a. Derive the output equation of the inverting adder. Design an adder op-amp circuit to obtain an output voltage $V_o = -(0.1V_1 + 0.5V_2 + 20V_3)$. Select $R_f = 10 \text{ K}\Omega$. (07 Marks)
- b. What is an integrator? Derive its output equation. (05 Marks)
- c. Derive the output expressions for the following op-amp applications:
(i) Voltage follower (ii) Subtractor (08 Marks)

Module-3

- 5 a. What are Radix-2, Radix-8, Radix-10 and Radix-16 number system? Perform the following operations:
i) $(1234.56)_8 = (?)_{10}$ ii) $(BAD.DAD)_{16} = (?)_8$ iii) $(988.86)_{10} = (?)_{16}$ (08 Marks)
- b. Perform the following using 2's complement method:
i) $(15)_{10} - (28)_{10}$ ii) $(1011.10)_2 - (1000.01)_2$ (05 Marks)
- c. Write the symbol and truth table of the following gates:
i) AND ii) NOR iii) XOR iv) NAND (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Simplify and realize the following Boolean expressions using basic gates:
- $Y = \overline{A} \overline{B} \overline{C} + \overline{A} \overline{B} C + \overline{A} B \overline{C} + A \overline{B} \overline{C}$
 - $Y = ABC + A\overline{B}C + AB\overline{C} + \overline{A}BC$
 - $Y = \overline{(A+B)(A+C)(B+C)}$ (08 Marks)
- b. Implement XOR gate using only NOR gates. (05 Marks)
- c. Write truth table of half-adder and full-adders. Realize the full-adder using two half-adders. (07 Marks)

Module-4

- 7 a. What is flip-flop and latch? Explain the operation of SR latch using NAND gates. (07 Marks)
- b. Explain the working of clocked SR flip-flop with a suitable logic diagram and a truth table. (08 Marks)
- c. Explain the working of NAND gate latch and NOR gate latch. (05 Marks)

OR

- 8 a. What is microcontroller? List out the main features of 8051 microcontroller. (05 Marks)
- b. With a neat block diagram, explain the architecture of 8051 microcontroller. (09 Marks)
- c. What is stepper motor? Explain the working and interfacing of stepper motor to a 8051 microcontroller. (06 Marks)

Module-5

- 9 a. What is amplitude modulation and frequency modulation? With the help of neat waveform, derive the expression for AM wave. (07 Marks)
- b. A carrier signal with $A_c = 40 \text{ V}$ and $f_c = 1 \text{ MHz}$ is amplitude modulated with a modulating signal $A_m = 4 \text{ V}$ and $f_m = 2.5 \text{ kHz}$. The depth of the modulation is 75%. Calculate the following: (i) P_c (ii) P_T (iii) P_{SB} (iv) BW (v) Sideband frequencies. Assume $R = 2\Omega$. (07 Marks)
- c. What is demodulation? Explain the working of AM detector circuit. (06 Marks)

OR

- 10 a. What is transducer? Explain the working of resistance transducer and resistance thermometer. (07 Marks)
- b. What is LVDT? Explain the construction, operation and applications of LVDT. (07 Marks)
- c. Explain the working of piezoelectric and photoelectric transducers. (06 Marks)

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15ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Draw forward and reverse V- I, characteristics of Si and Ge diodes and make any two comparison between Si and Ge diodes. (04 Marks)
- b. With a neat circuit diagram, input and output waveforms, explain the working of an Half wave diode rectifier. (06 Marks)
- c. A full-wave rectifier supplies a load of 1000Ω . The ac voltage applied to it is 200-0-200 V(rms). Calculate i) I_{Dc} ii) I_{rms} iii) efficiency (η), Assume $R_f = 0\Omega$. (06 Marks)

OR

- 2 a. Define ' α ' and ' β ' of a transistor amplifier and derive the relation between α and β . (04 Marks)
- b. With a neat circuit diagram, input and output waveforms, explain the operation of a Full wave two diode rectifier. (06 Marks)
- c. Draw an output characteristics of CE-transistor amplifier, mark different regions of working on it, explain each region of working. (06 Marks)

Module-2

- 3 a. With a neat sketch and equations, explain what is dc load line and bias point in a CE base bias amplifier. (04 Marks)
- b. Explain with neat circuit diagram and equations, voltage divider bias amplifier. (06 Marks)
- c. Design bias-bias transistor circuit, using 'Si' transistor having ' β ' value of 100, V_{CC} is 10V, and dc bias conditions are to be $V_{ce} = 5v$ and $I_c = 5mA$. (06 Marks)

OR

- 4 a. Define CMRR and slew rate and write any four ideal characteristics for op-amp. (04 Marks)
- b. With a neat circuit diagram, derive an equation for op-amp application as

i) Inverting amplifier	ii) Non-inverting amplifier
iii) Inverting 2-input summer	iv) Subtractor
v) Integrator	vi) Differentiator.

(12 Marks)

Module-3

- 5 a. Convert $(1101010)_2 = ()_{10}$ and $(65)_{10} = ()_2$ (04 Marks)
- b. Convert $(ABCD)_{16} = ()_8$ and $(16000)_8 = ()_{16}$ (04 Marks)
- c. Write the truth table, design equations and circuit diagram of an Half adder using logic gates. (08 Marks)

OR

- 6 a. State and prove De Morgan's Theorem for 3-variables. (04 Marks)
- b. Realize AND, OR and EX-OR gates using NAND gates. (06 Marks)
- c. Perform the following subtraction using 1's and 2's complement, $(10111001)_2 - (1011)_2$. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Compare flip-flop and Latch. (02 Marks)
b. With circuit diagram and truth table explain the working of a NAND gate latch. (07 Marks)
c. Explain the operation of clocked RS-flip flop, with circuit diagram and truth table. (07 Marks)

OR

- 8 a. Explain with circuit diagram and truth table working of NOR gate latch. (06 Marks)
b. Draw the architecture of 8051 microcontroller, explain the function of each block used in it. (10 Marks)

Module-5

- 9 a. Draw the block diagram of communication system, explain the functions of each block used in it. (05 Marks)
b. Define amplitude modulation and derive equation of amplitude modulated double side band wave. (05 Marks)
c. A carrier of 2MHz has 1kW of its power amplitude modulated with a sinusoidal signal of 2KHz, the depth of modulation is 60% Calculate the side band frequencies, signal band width, power in side bands, and total power of modulated wave. (06 Marks)

OR

- 10 a. Distinguish between active and passive transducers. (02 Marks)
b. Bring out any four differences between amplitude modulation and frequency modulation. (04 Marks)
c. Explain with neat diagram working of LVDT. (10 Marks)

First Semester B.E. Degree Examination, June/July 2019
Basic Electronics

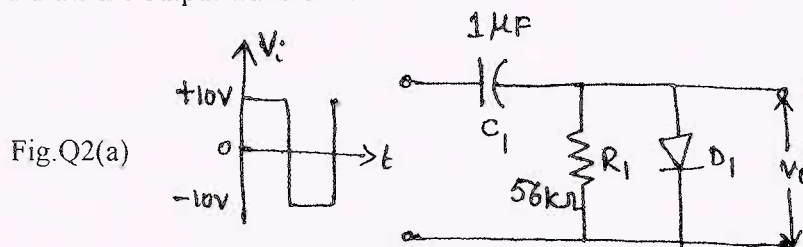
Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast ONE question from each part.

PART - 1

1.
 - a. Sketch and discuss the forward and reverse characteristics of a silicon diode. (05 Marks)
 - b. Define rms and dc or average value of voltage, peak inverse voltage, ripple factor and conversion efficiency with respect to Half wave rectifier. (10 Marks)
 - c. A full wave rectifier circuit provides peak secondary voltage of 35V, the load resistance $R_L = 1\text{ k}\Omega$, $R_T = 13\Omega$, $R_s = 12\Omega$. Find the dc and rms value of output voltage. Also find the regulation. (05 Marks)
2.
 - a. The diode clamping circuit in fig. Q2(a) has $\pm 10\text{V}$, 1 kHz square wave input. Calculate the tilt, and draw the output waveform. (06 Marks)



- b. Sketch and explain Zener diode voltage regulator. Discuss the effects of load current. (06 Marks)
 - c. Explain BJT common emitter configuration with a suitable circuit, to draw the input and output characteristics. (08 Marks)

PART - 2

3.
 - a. Explain the operation of Base bias circuit and write the equations for I_B , I_C and V_{CE} . (04 Marks)
 - b. A voltage divider bias circuit has $V_{CC} = 10\text{V}$, $R_C = 2.2\text{ k}\Omega$, $R_1 = 82\text{ k}\Omega$, $R_2 = 18\text{ k}\Omega$, $R_E = 0.5\text{ k}\Omega$. Find the 'Q' point and terminal voltages (V_B , V_C , V_E). Draw the load line and locate the operating point. (08 Marks)
 - c. Mention the ideal characteristics of an Op - amp and explain the concept of virtual ground. (08 Marks)
4.
 - a. Derive an expression for output voltage of a Non - Inverting summing circuit. Draw the circuit. (10 Marks)
 - b. The two input voltages of an op-amp are 2V and 3V. The common output voltage is 2mV and the difference mode output voltage is 9V. Find CMRR. (05 Marks)
 - c. For a base bias circuit configuration $R_B = 470\text{ k}\Omega$, $R_C = 2.2\text{ k}\Omega$ and $V_{CC} = 18\text{V}$ and $\beta = 100$. Find I_B , I_C , V_{CE} . (05 Marks)

PART - 3

- 5 a. Convert : i) $(47.8125)_{10} = (?)_2$ ii) $(1011101.1011)_2 = (?)_{16}$ iii) $(BCDE)_{16} = (?)_8 = (?)_{10}$. (06 Marks)
- b. Subtract i) 101000_2 from 0101111 using one's complement
ii) $(15)_{10} - (18)_{10}$ using 2's complement. (05 Marks)
- c. State and prove De - Morgan's theorem for two input variables by induction method. (05 Marks)
- d. Realize 'AND' gate using 'NOR' gate and 'OR' gate by 'NAND' gates only. (04 Marks)
- 6 a. Simplify the following Boolean expressions and implement the same using NOR gates only.
i) $F = \bar{X} \bar{Y} \bar{Z} + \bar{X} \bar{Y} \bar{Z} + \bar{X} \bar{Y} + X \bar{Y}$ ii) $F = (X + Y) (\bar{X} + Z) (\bar{Y} + Z)$. (07 Marks)
- b. For the given Boolean expression, draw the logic diagram using basic gates.
i) $Y = \overline{AB(C+D)}$ ii) $Z = \overline{X+AB}$. (05 Marks)
- c. Design Full adder using Half address. Write the expressions for SUM and CARRY. Also write the Truth Table. (08 Marks)

PART - 4

- 7 a. Draw NOR gate latch and its truth table. Explain the working of a NOR gate latch. (04 Marks)
- b. With a block diagram, explain the working of 8085 μ p. (06 Marks)
- c. Explain the working of clocked RS flip - flop. (05 Marks)
- d. What is Transducer? Compare active and passive transducers. (05 Marks)
- 8 a. Explain the working of LVDT. (06 Marks)
- b. Define Seebeck effect, Peltier and Thompson effect. (06 Marks)
- c. What is a microcontroller? List specific features of 8051 architecture. (06 Marks)
- d. Bring out the differences between piezoelectric and photo electric transducers. (02 Marks)

PART - 5

- 9 a. Derive an expression for AM wave. Write the spectrum. (06 Marks)
- b. Show that the total power in the modulated wave is 1.5 times the power in carrier. (06 Marks)
- c. Derive an expression for frequency modulated wave. (08 Marks)
- 10 a. Compare AM and FM. (05 Marks)
- b. Explain the operation of mobile communication with a block diagram. (05 Marks)
- c. Write a note on ISDN. (05 Marks)
- d. What are the advantages and disadvantages of an optical fiber communication? (05 Marks)

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First/Second Semester B.E. Degree Examination, June/July 2019
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer FIVE full questions, choosing one full question from each module.
 2. Use of Steam table is permitted.

Module-1

- 1 a. List and explain any one source of energy. (06 Marks)
 b. Explain briefly : (i) Global Warming (ii) Ozone depletion (06 Marks)
 c. Find the enthalpy of 1 kg of steam at 12 bar when,
 (i) Steam is dry saturated.
 (ii) Steam is 22% wet and
 (iii) Super heated to 250°C
 Assume the specific heat of the super heated steam as 2.25 KJ/kgK. (08 Marks)

OR

- 2 a. Explain briefly any two of the following:
 (i) Zeroth law of thermodynamics.
 (ii) First law of thermodynamics.
 (iii) Second law of thermodynamics. (06 Marks)
 b. Explain formation of steam with the help of Temperature-Enthalpy (T-h) diagram. (08 Marks)
 c. Find the specific volume and enthalpy of 1 kg of steam at 0.8 MPa.
 (i) When the dryness fraction is 0.9.
 (ii) When the steam is super heated to a temperature of 300°C.
 The specific heat of the super heated steam is 2.25 KJ/kgK. (06 Marks)

Module-2

- 3 a. With a neat labeled diagram, explain working of Babcock and Wilcox boiler. (08 Marks)
 b. Define prime movers and explain working of Pelton wheel turbine with a neat sketch. (12 Marks)

OR

- 4 a. Define (i) Boiler Mountings. (ii) Boiler Accessories.
 Explain functions of any five mountings or accessories. (12 Marks)
 b. What are hydraulic pumps? Explain centrifugal pump with a neat sketch. (08 Marks)

Module-3

- 5 a. Explain 4-s petrol engines with P-V diagram. (10 Marks)
 b. Give comparisons between petrol and diesel engines. (05 Marks)
 c. A four stroke IC engine running at 450 rpm has a bore diameter of 100 mm and stroke length 120 mm. The indicated diagram details are,
 (i) Area of the diagram 4 cm²
 (ii) Length of the indicated diagram 6.5 cm
 (iii) Spring value of the spring used 10 bar/cm.
 Calculate the indicated power of the engine. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain with a neat sketch working of vapour compression Refrigerator. (08 Marks)
 b. Define : (i) Ton of Refrigerator (ii) COP (iii) Ice making capacity (06 Marks)
 c. List commonly used refrigerants and mention the applications of air conditioners. (06 Marks)

Module-4

- 7 a. Classify ferrous and non ferrous metals. (05 Marks)
 b. Define composites, explain any two of the following : (i) Piezoelectric materials.
 (ii) Shape memory alloys (iii) Optical fibre glass. (05 Marks)
 c. Classify metal joining processes, explain TIG (Tungsten Inert Gas) Welding with a neat sketch. (10 Marks)

OR

- 8 a. Derive an expression for length of the belt in open belt drive. (10 Marks)
 b. Mention advantages and disadvantages of V-Belt drive. (05 Marks)
 c. List different types of gears and explain any one with its advantages. (05 Marks)

Module-5

- 9 a. Explain briefly the following:
 (i) Turning
 (ii) Facing
 (iii) Thread cutting (06 Marks)
 b. Explain the working of horizontal milling machine with a simple line diagram. (08 Marks)
 c. Explain briefly:
 (i) Angular milling.
 (ii) Gang milling.
 (iii) Plane milling. (06 Marks)

OR

- 10 a. Explain briefly the components of a CNC machine with a neat block diagram. (08 Marks)
 b. Define Robots and mention its general applications. (07 Marks)
 c. Write short note on:
 CNC Machining Center or Turning Center. (05 Marks)

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17EME14/24

Second Semester B.E. Degree Examination, June/July 2019 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. Distinguish between non-renewable and renewable sources of energy. (06 Marks)
 b. With neat sketch describe working hydroelectric power plant. (08 marks)
 c. What are bio fuels? Compare them with petroleum based fuels. (06 Marks)

OR

- 2 a. What is a boiler? Classify them. (06 marks)
 b. Briefly describe steam formation with the help of T-H diagram. (04 marks)
 c. Explain working of Babcock and Wilox boiler with a neat sketch. (10 marks)

Module-2

- 3 a. Distinguish between impulse and reaction steam turbines. (06 Marks)
 b. Explain working of Kaplan water turbine. (08 Marks)
 c. Compare petrol engine with diesel engine. (06 Marks)

OR

- 4 a. A four stroke single cylinder internal combustion engine has a volume of 6 litres and runs at 300 rpm. At full load, tight side and slack side tensions of belt dynamometer are 700N and 300N respectively. The diameter of pulley dynamometer is 1m. The mass of fuel is 4 kg/hr with a calorific value of 42000kJ/kg. If the indicated mean effective pressure is 6 bar, determine the brake power, indicated power, mechanical efficiency, indicated thermal efficiency and brake specific fuel consumption. (10 Marks)
 b. With neat sketches explain working of four stroke petrol engine. (10 Marks)

Module-3

- 5 a. What is machine tool? Explain thread cutting and taper turning operations with neat sketches. (08 Marks)
 b. Differentiate between reaming and boring. (06 marks)
 c. Sketch and explain slot milling and end milling. (06 Marks)

OR

- 6 a. Compare NC machine tool with CNC machine. (04 Marks)
 b. What is automation? Enlist advantages and limitation of robot physical configuration with neat sketches. (16 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. State the composition, properties of any four ferrous metals. (08 marks)
b. How are composite materials classified? Enlist their application in biomedical and military. (08 Marks)
c. Sketch and explain electric arc welding. (04 Marks)

OR

- 8 a. State the composition and applications of any four non ferrous metals. (08 Marks)
b. Compare welding with brazing. (06 marks)
c. Sketch and explain gas welding. (06 Marks)

Module-5

- 9 a. What is refrigeration? What are desirable properties of a good refrigerant? (06 marks)
b. Compare refrigeration system with air conditioning. (04 Marks)
c. Explain the principle and working of vapour absorption refrigeration with neat sketch. (10 Marks)

OR

- 10 a. Name commonly used refrigerants for different applications. (05 marks)
b. What is principle of refrigeration? Name essential parts of refrigerator and briefly explain their functions. (05 marks)
c. Explain the principle and working of room air conditioner with neat sketch. (10 Marks)

CBCS SCHEME

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14EME14/24

First/Second Semester B.E. Degree Examination, June/July 2019 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Classify renewable and non-renewable energy sources and explain. (10 Marks)
b. Name some of the bio-fuels used in engineering application. (05 Marks)
c. Explain the principle of solar photovoltaic cell. (05 Marks)

OR

- 2 a. Classify the fuels and explain,
i) Calorific value (08 Marks)
ii) Combustion. (08 Marks)
b. Explain the properties of steam and with a neat sketch explain the formation of steam. (08 Marks)
c. List the boiler mountings and accessories. (04 Marks)

Module-2

- 3 a. Explain with a neat sketch and working principle of Parson's turbine. (08 Marks)
b. Classify turbines in detail. (04 Marks)
c. With P-V diagram, explain four stroke diesel engine. (08 Marks)

OR

- 4 a. With a neat sketch, explain two stroke petrol engine. (08 Marks)
b. Explain principle and working of pelton wheel. (06 Marks)
c. In a 4 stroke diesel engine has a piston diameter 250 mm, stroke 400 mm, mep = 4 bar and speed is 500 rpm. Diameter of the brake drum is 1000 mm. Effective brake load is 400 N. Calculate I.P, B.P and F. P. (06 Marks)

Module-3

- 5 a. Classify the robots based on configuration. (06 Marks)
b. What are the advantages and disadvantages of automation? (06 Marks)
c. Explain any four kinds of operations performed on lathe machine. (08 Marks)

OR

- 6 a. Explain any four drilling operations performed on drilling machine. (08 Marks)
b. What are the advantages and disadvantages of robots? (06 Marks)
c. Explain fixed and flexible automation process. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Classify the engineering materials. (06 Marks)
b. Classify the composite materials and its application in aircraft and automobile application. (08 Marks)
c. With a neat sketch, explain oxy – acetylene welding. (06 Marks)

OR

- 8 a. With a neat sketch, explain Arc – welding. (06 Marks)
b. What are the differences between soldering, welding and brazing? (06 Marks)
c. List the application of Ferrous alloys. (04 Marks)
d. Write a note on composites materials and mention its applications. (04 Marks)

Module-5

- 9 a. What are the properties of good refrigerant? (06 Marks)
b. Explain the principle of working of vapour absorption refrigeration, with a neat diagram. (10 Marks)
c. Define the term :
i) COP
ii) Unit of refrigeration. (04 Marks)

OR

- 10 a. Explain the working principle of room air conditioning with a neat sketch. (10 Marks)
b. List commonly used refrigerant and its properties. (06 Marks)
c. Define the term :
i) Ton of refrigeration
ii) Refrigerating effect. (04 Marks)

* * * * *

6. Teacher : -----
 a) HuDuga
 c) Shikshaka/ki
 b) Manushya
 d) Shishya
7. Vegetable : -----
 a) tarakari
 c) tavaruru
 b) takararu
 d) tamota
8. Garden : -----
 a) Mane
 c) TooTa
 b) Shaale
 d) Baagilu

**Note : Translate the following English words to Kannada
 [from Q No. 9 to 13]**

9. Near
 a) Swalpa
 c) heege
 b) hattira
 d) hosa
10. Shop
 a) AngaDi
 c) kante
 b) dukan
 d) Mane.
11. See
 a) NooDu
 c) BiDu
 b) MaaDu
 d) IDu
12. Moon
 a) candra
 c) Naksatra
 b) Suurya
 d) Boomi
13. Child
 a) Maanava
 c) MahiLe
 b) Magu
 d) HeNNu

**Note : Substitute the words from the following each sentence in appropriate place
 [From Q No. 14 to 16]**

14. naanu uuTa maaDu
 a) maaDuttene
 c) maaDisu
 b) maaDideya
 d) maaDi
15. Namma manege baa ?
 a) Baruttiya
 c) BeDa
 b) Bandi
 d) Baru
16. Nanna hattira Kutka.
 a) KuLituko
 c) Kundru
 b) KooDu
 d) None.

**Note : Translate the Kannada word into English.
 [From Q No. 17 to 26]**

17. Meenu
 a) Animal
 c) Crow
 b) Fish
 d) Owl

18. Nayee
a) Pig
c) Dog
19. Aat
a) See
c) Go
20. Mana
a) Home
c) Pen
21. Nanu
a) I
c) We
22. Maga
a) Father
c) Daugher
23. Baa
a) Go
c) Visit
24. Kaagad
a) Chair
c) Mouce
25. Avanu
a) He
c) It
26. Aangla
a) Kannada
c) Marathi
- b) Cow
d) Cat
- b) Come
d) Play
- b) School
d) Mind
- b) You
d) He
- b) Sister
d) Son.
- b) Sit
d) Come
- b) Computer
d) Paper
- b) She
d) They
- b) English
d) Urdu.

Note : Write the English word for given Kannada word [From Q No. 27 to 30]

27. HaLe
a) New
c) Not
28. Kurci
a) Table
c) Chair
29. GaNita
a) Physics
c) Mathematics
30. Shaale
a) Home
c) Office
- b) Now
d) Old
- b) Book
d) Pen
- b) Biology
d) English
- b) School
d) Room.

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Ver-D 3 of 3

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Question Paper Version : D

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019**Kannada Kali****(COMMON TO ALL BRANCHES)**

Time: 2 hrs.]

[Max. Marks: 30

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the thirty questions, each question carries **ONE** mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, use of whiteners** on the **OMR** sheets are strictly prohibited.

Note : Fill in the blank choosing the right word from the group below :

1. nanage ninna sahavaasa khanDitaa -----
a) BeDa
b) Beka
c) Ide
d) Illa.

**Note : Translate the following Kannada question into English.
[from question No. 2 to 3]**

2. Niivu yaaru ?
a) who is this?
b) what is this?
c) who are you?
d) what is there?
3. Idu Enu?
a) who is this?
b) what is this?
c) who are you?
d) what is there?

**Note : Fill in the blank by translating the given English word to Kannada.
[From Question No : 4 to 8]**

4. He : -----
a) NAnu
b) Neenu
c) Avanu
d) AvaLu
5. When : -----
a) Yaaru
b) Yaavaga
c) Yelli
d) Yaake

Ver-D 1 of 3

6. Teacher : -----
 a) HuDuga
 c) Shikshaka/ki
 b) Manushya
 d) Shishya
7. Vegetable : -----
 a) tarakari
 c) tavaruru
 b) takararu
 d) tamota
8. Garden : -----
 a) Mane
 c) TooTa
 b) Shaale
 d) Baagilu

**Note : Translate the following English words to Kannada
 [from Q No. 9 to 13]**

9. Near
 a) Swalpa
 c) heege
 b) hattira
 d) hosa
10. Shop
 a) AngaDi
 c) kante
 b) dukan
 d) Mane.
11. See
 a) NooDu
 c) BiDu
 b) MaaDu
 d) IDu
12. Moon
 a) candra
 c) Naksatra
 b) Suurya
 d) Boomi
13. Child
 a) Maanava
 c) MahiLe
 b) Magu
 d) HeNNU

**Note : Substitute the words from the following each sentence in appropriate place
 [From Q No. 14 to 16]**

14. naanu uuTa maaDu
 a) maaDuttene
 c) maaDisu
 b) maaDideya
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 a) Baruttiya
 c) BeDa
 b) Bandi
 d) Baru
16. Nanna hattira Kutka.
 a) KuLituko
 c) Kundru
 b) KooDu
 d) None.

**Note : Translate the Kannada word into English.
 [From Q No. 17 to 26]**

17. Meenu
 a) Animal
 c) Crow
 b) Fish
 d) Owl

18. Nayee
a) Pig
c) Dog
19. Aat
a) See
c) Go
20. Mana
a) Home
c) Pen
21. Nanu
a) I
c) We
22. Maga
a) Father
c) Daugher
23. Baa
a) Go
c) Visit
24. Kaagad
a) Chair
c) Mouce
25. Avanu
a) He
c) It
26. Aangla
a) Kannada
c) Marathi
- b) Cow
d) Cat
- b) Come
d) Play
- b) School
d) Mind
- b) You
d) He
- b) Sister
d) Son.
- b) Sit
d) Come
- b) Computer
d) Paper
- b) She
d) They
- b) English
d) Urdu.

Note : Write the English word for given Kannada word [From Q No. 27 to 30]

27. HaLe
a) New
c) Not
28. Kurci
a) Table
c) Chair
29. GaNita
a) Physics
c) Mathematics
30. Shaale
a) Home
c) Office
- b) Now
d) Old
- b) Book
d) Pen
- b) Biology
d) English
- b) School
d) Room.

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Ver-D 3 of 3

USN

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Question Paper Version : D

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

Kannada Kali

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the thirty questions, each question carries **ONE** mark.
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Note : Fill in the blank choosing the right word from the group below :

1. nanage ninna sahavaasa khanDitaa -----.

- | | |
|---------|----------|
| a) BeDa | b) Beka |
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Note : Translate the following Kannada question into English.

[from question No. 2 to 3]

2. Niivu yaaru ?

- | | |
|-----------------|-------------------|
| a) who is this? | b) what is this? |
| c) who are you? | d) what is there? |

3. Idu Enu?

- | | |
|-----------------|-------------------|
| a) who is this? | b) what is this? |
| c) who are you? | d) what is there? |

Note : Fill in the blank by translating the given English word to Kannada.

[From Question No : 4 to 8]

4. He : -----

- | | |
|----------|----------|
| a) NAnu | b) Neenu |
| c) Avanu | d) AvaLu |

5. When : -----

- | | |
|----------|------------|
| a) Yaaru | b) Yaavaga |
| c) Yelli | d) Yaake |

Ver-D 1 of 3

6. Teacher : -----
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 c) Shikshaka/ki
 b) Manushya
 d) Shishya
7. Vegetable : -----
 a) tarakari
 c) tavaruru
 b) takararu
 d) tamota
8. Garden : -----
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 c) TooTa
 b) Shaale
 d) Baagilu

**Note : Translate the following English words to Kannada
 [from Q No. 9 to 13]**

9. Near
 a) Swalpa
 c) heege
 b) hattira
 d) hosa
10. Shop
 a) AngaDi
 c) kante
 b) dukan
 d) Mane.
11. See
 a) NooDu
 c) BiDu
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12. Moon
 a) candra
 c) Naksatra
 b) Suurya
 d) Boomi
13. Child
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 c) MahiLe
 b) Magu
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**Note : Substitute the words from the following each sentence in appropriate place
 [From Q No. 14 to 16]**

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b) Sit
d) Come
24. Kaagad
a) Chair
c) Mouce
b) Computer
d) Paper
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Note : Write the English word for given Kannada word [From Q No. 27 to 30]

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a) New
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b) Now
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a) Table
c) Chair
b) Book
d) Pen
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a) Physics
c) Mathematics
b) Biology
d) English
30. Shaale
a) Home
c) Office
b) School
d) Room.

*** **

Ver-D 3 of 3

6. Teacher : -----
 a) HuDuga
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 b) maaDideya
 d) maaDi
15. Namma manege baa ?
 a) Baruttiya
 c) BeDa
 b) Bandi
 d) Baru
16. Nanna hattira Kutka.
 a) KuLituko
 c) Kundru
 b) KooDu
 d) None.

**Note : Translate the Kannada word into English.
 [From Q No. 17 to 26]**

17. Meenu
 a) Animal
 c) Crow
 b) Fish
 d) Owl

18. Nayee
a) Pig
c) Dog
b) Cow
d) Cat
19. Aat
a) See
c) Go
b) Come
d) Play
20. Mana
a) Home
c) Pen
b) School
d) Mind
21. Nanu
a) I
c) We
b) You
d) He
22. Maga
a) Father
c) Daugher
b) Sister
d) Son.
23. Baa
a) Go
c) Visit
b) Sit
d) Come
24. Kaagad
a) Chair
c) Mouce
b) Computer
d) Paper
25. Avanu
a) He
c) It
b) She
d) They
26. Aangla
a) Kannada
c) Marathi
b) English
d) Urdu.

Note : Write the English word for given Kannada word [From Q No. 27 to 30]

27. HaLe
a) New
c) Not
b) Now
d) Old
28. Kurci
a) Table
c) Chair
b) Book
d) Pen
29. GaNita
a) Physics
c) Mathematics
b) Biology
d) English
30. Shaale
a) Home
c) Office
b) School
d) Room.

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Ver-D 3 of 3

6. Teacher : -----
 a) HuDuga
 c) Shikshaka/ki
 b) Manushya
 d) Shishya
7. Vegetable : -----
 a) tarakari
 c) tavaruru
 b) takararu
 d) tamota
8. Garden : -----
 a) Mane
 c) TooTa
 b) Shaale
 d) Baagilu

**Note : Translate the following English words to Kannada
 [from Q No. 9 to 13]**

9. Near
 a) Swalpa
 c) heege
 b) hattira
 d) hosa
10. Shop
 a) AngaDi
 c) kante
 b) dukan
 d) Mane.
11. Sec
 a) NooDu
 c) BiDu
 b) MaaDu
 d) IDu
12. Moon
 a) candra
 c) Naksatra
 b) Suurya
 d) Boomi
13. Child
 a) Maanava
 c) MahiLe
 b) Magu
 d) HeNNU

**Note : Substitute the words from the following each sentence in appropriate place
 [From Q No. 14 to 16]**

14. naanu uuTa maaDu
 a) maaDuttene
 c) maaDisu
 b) maaDideya
 d) maaDi
15. Namma manege baa ?
 a) Baruttiya
 c) BeDa
 b) Bandi
 d) Baru
16. Nanna hattira Kutka.
 a) KuLituko
 c) Kundru
 b) KooDu
 d) None.

**Note : Translate the Kannada word into English.
 [From Q No. 17 to 26]**

17. Meenu
 a) Animal
 c) Crow
 b) Fish
 d) Owl

18. Nayee
a) Pig
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b) Cow
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20. Mana
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21. Nanu
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22. Maga
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23. Baa
a) Go
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a) Chair
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25. Avanu
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Note : Write the English word for given Kannada word [From Q No. 27 to 30]

27. HaLe
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a) Home
c) Office
b) School
d) Room.

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Ver-D 3 of 3

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

ಕನ್ನಡ ಮನಸು

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

ಸೂಚನೆಗಳು

1. ಎಲ್ಲ ೩೦ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರಿಸಿರಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.
2. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯು.ಎಸ್.ಎನ್ ಸಂಖ್ಯೆ ಹಾಗೂ ಪಶ್ಚಿಮ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ಅಂದರೆ A, B, C ಅಥವಾ D ಯನ್ನು ತಪ್ಪಿಲ್ಲದಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಗುರುತಿಸುವುದು ಅಭ್ಯರ್ಥಿಯ ಜವಾಬ್ದಾರಿಯಾಗಿರುತ್ತದೆ.
3. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವ ಸ್ಥಳದಲ್ಲಿ ಭರ್ತಿಮಾಡದೆ ಹಾಗೆಯೇ ಬಿಟ್ಟಲ್ಲಿ ಅಥವಾ ಭರ್ತಿಮಾಡಿದ ಮಾಹಿತಿಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಅಂತಹ ಉತ್ತರ ಪತ್ರಿಕೆಗಳನ್ನು ರದ್ದು ಪಡಿಸಲಾಗುವುದು.
4. ಕೇವಲ ಒಂದು ಉತ್ತರವನ್ನು ಮಾತ್ರ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಗುರುತಿಸತಕ್ಕದ್ದು. ಒಂದೆ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಉತ್ತರವನ್ನು ಗುರುತಿಸುವುದು ಅಪೂರ್ಣ.
5. ಎಲ್ಲಾ ಉತ್ತರಗಳನ್ನು ನಿಮಗೆ ಒದಗಿಸಲಾದ ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯ ಹಾಳೆಯ ಮೇಲೆ ಕಪ್ಪು ಅಥವಾ ನೀಲಿ ಶಾಹಿಯ ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಗುರುತು ಮಾಡಬೇಕು.

1. ಶ್ರೀ ಸಿದ್ಧಲಿಂಗಯ್ಯನವರ 'ಬೆಳ್ಳಿಯ ಹಾಡು' ಕವನದಲ್ಲಿ ಕಂಡುಬರುವ ಅಂಶ :
 ಅ) ಸಮಾಜದ ಸುಸ್ಥಿತಿ ಬ) ಪ್ರೇಮದ ರಮ್ಯತೆ
 ಕ) ಭಕ್ತಿಯ ಪರವಶತೆ ಡ) ದಲಿತರ ಕನಸು
2. 'ಒಲೆಹತ್ತಿ ಉರಿದಡೆ ನಿಲಬಹುದಲ್ಲದೇ, ಧರೆಹತ್ತಿ ಉರಿದರೆ ನಿಲಬಾರದು, ಏರಿ ನೀರುಂಬಡೆ ಬೇಲಿ ಹೊಲದ ಮೇವೊಡೆ, ನಾರಿ ತನ್ನ ಮನೆಯಲ್ಲಿ ಕಳುವೊಡೆ, ತಾಯಿಯ ಮೊಲೆಹಾಲು ನಂಜಾಗಿ ಕೊಲವುಡೆ ಇನ್ನಾರಿಗೆ ದೂರುವೆ ಕೂಡಲ ಸಂಗಮದೇವಾ' ಈ ವಚನದ ರಚನೆಕಾರರು:
 ಅ) ಸರ್ವಜ್ಞ ಬ) ಚಾಮರಸ
 ಕ) ಅಲ್ಲಮಪ್ರಭು ಡ) ಬಸವಣ್ಣ
3. ಮಲೆಮಾದೇಶ್ವರ ಬೆಟ್ಟವಿರುವ ಸ್ಥಳ:
 ಅ) ಅರಿಶಿನಕುಂಟೆ ಬ) ಅಥಣಿ
 ಕ) ಅಘಜಲಪುರ ಡ) ಕೊಳ್ಳೆಗಾಲ

4. 'ಶ್ರೀ ಸಂಗೊಳ್ಳಿ ರಾಯಣ್ಣ' ಯಾರು?
 ಅ) ಅದ್ಭುತ ಭಾಷಣಕಾರ ಬ) ವಂದಿಮಾಗಧರಿಗೆ ಸೇರಿದವನು
 ಕ) ಬ್ಯಾಂಕಗಳಿಗೆ ಮೋಸ ಮಾಡಿದವನು ಡ) ಬ್ರಿಟಿಷರ ವಿರುದ್ಧ ಹೋರಾಡಿದ ಹೋರಾಟಗಾರ
5. ಮೊದಲು ಕನ್ನಡಕ್ಕೊಂದು ಅಪರೂಪ ನಿಘಂಟನ್ನು ರಚಿಸಿಕೊಟ್ಟವರು:
 ಅ) ಪಂಪ ಬ) ಹರಿಹರ
 ಕ) ಮೆಕಾಲೆ ಡ) ಕಿಟ್ಟೆಲ್
6. 'ಕನ್ನಡ ಸಂಸ್ಕೃತಿ' ಈ ರೀತಿಯಾಗಿದೆ :
 ಅ) ಬಹುರೂಪಿಯಾಗಿದೆ ಬ) ವರ್ಣರಂಜಿತವಾಗಿದೆ
 ಕ) ಜೀವಂತವಾಗಿದೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
7. ಪತ್ರ ವ್ಯವಹಾರ - ಋನವಿಗಳಲ್ಲಿ ಇರಬೇಕಾದದ್ದು :
 ಅ) ಸ್ಪಷ್ಟ ಮಾಹಿತಿ ಬ) ನೇರ ನಿರೂಪಣೆ
 ಕ) ಸೌಜನ್ಯ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
8. ಸಚಿವ + ಅಲಯ = ಸಚಿವಾಲಯ, ಇಲ್ಲಿರುವ ಸಂಧಿ :
 ಅ) ಸುವರ್ಣ ಸಂಧಿ ಬ) ಸರ್ವ ಧೀರ್ಘ ಸಂಧಿ
 ಕ) ರಾಜಯೋಗ ಸಂಧಿ ಡ) ವೃದ್ಧಿ ಸಂಧಿ
9. 'ವಿಶ್ವ ಮಾನವತೆ' ಎನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ಕಂದಾಚಾರ ಬ) ಮೂಢನಂಬಿಕೆ
 ಕ) ಸಾಮರಸ್ಯ-ಸಹಿಷ್ಣುತೆ ಡ) ಮತೀಯ ದ್ವೇಷ
10. 'ಪಡುವಣ' ಪದದ ವಿರುದ್ಧಾರ್ಥಕ ಪದ
 ಅ) ಕೊಂಕಣ ಬ) ಬಡಗಣ
 ಕ) ತೆಂಕಣ ಡ) ಮೂಡಣ
11. 'ನಾನು ನಿನ್ನೆ ಕೆ.ಜಿ.ಎಫ್‌ಗೆ ಹೋಗಿದ್ದೆನು' ಈ ವಾಕ್ಯದಲ್ಲಿರುವ ಕಾಲ :
 ಅ) ಭೂತ ಕಾಲ ಬ) ರಾಜಯೋಗ ಕಾಲ
 ಕ) ಯಮಗಂಡ ಕಾಲ ಡ) ರಾಹು ಕಾಲ
12. 'ಫೋಟೋಗ್ರಾಫಿ' ಪದಕ್ಕೆ ಸಮನಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ವರ್ಣ ಚಿತ್ರ ಬ) ಛಾಯಾ ಚಿತ್ರ
 ಕ) ತೈಲ ಚಿತ್ರ ಡ) ಚಲನ ಚಿತ್ರ
13. 'ಬೆಣ್ಣೆ ಹಚ್ಚು' ಪದದ ಸರಿಯಾದ ಅರ್ಥ:
 ಅ) ರೊಟ್ಟಿಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು ಬ) ದೋಸೆಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು
 ಕ) ಹೊಗಳುವುದು ಡ) ರಾಗಿಮುದ್ದೆಗೆ ಬೆಣ್ಣೆ

14. 'ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು' ಕವನ ಯಾವುದರ ಕುರಿತಾಗಿದೆ?
 ಅ) ಸಂಪ್ರದಾಯಗಳಿಗಿಂತಲು ಮಿಗಿಲಾಗಿರುವುದು ಮಹಿಳೆಯ ಘನತೆ.
 ಬ) ಮಹಿಳಾ ಮೀಸಲಾತಿ
 ಕ) ಸಮಾನತೆಗಾಗಿ ಚಳುವಳಿ
 ಡ) ಕನಸಿನ ಮದುವೆ
15. ಶ್ರೀ 'ಬಂದೇ ನವಾಜ್' ಯಾರು?
 ಅ) ಗುಲಬರ್ಗಾದ ಸೂಫಿ ಸಂತರು
 ಬ) ಬ್ರಿಟಿಶರಿಂದ ಉಂಬಳಿ ಪಡೆದವರು
 ಕ) ವಜ್ರ ವ್ಯಾಪಾರಿಗಳು
 ಡ) ಗಣಿ ಧಣಿ
16. 'ರೆಹಮಾನರ ಹಾಡಿನ ಕಂಪೋರಿಷನ ಚೆನ್ನಾಗಿದೆ' ಎನ್ನುವ ವಾಕ್ಯದಲ್ಲಿ ಕಂಪೋರಿಷನ ಪದಕ್ಕೆ ಸರಿಯಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ಧ್ವನಿ ಸಂಪತ್ತು
 ಬ) ಸಂಯೋಜನೆ
 ಕ) ನಿರ್ದೇಶನ
 ಡ) ಕಂಠದಾನ
17. 'ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು' ಲೇಖನದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಪ್ರವಾಸದ ಉದ್ದೇಶ :
 ಅ) ಆನೆ ದಂತ ಸಂಗ್ರಹಣೆ
 ಬ) ಖೆಡ್ಡಾಗಳ ಕುರಿತು ಅಧ್ಯಯನ
 ಕ) ಸಸ್ಯ ವೀಕ್ಷಣೆ
 ಡ) ಹುಲಿ ವೀಕ್ಷಣೆ
18. ಡಾ|| ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣನವರ 'ಗಾಂಧಿ' ಕಥೆ ಏನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ವರ್ಣಾಶ್ರಮ ಪದ್ಧತಿ
 ಬ) ಜಾತೀಯತೆ
 ಕ) ಮುಢ ನಂಬಿಕೆ
 ಡ) ಮಹಾತ್ಮ ಗಾಂಧೀಜಿಯವರ ಮೌಲ್ಯಗಳಿಗೆ ಒದಗಿರುವ ಅವಸ್ಥೆಯನ್ನು
19. ಶ್ರೀ ಶಿವರಾಮ ಕಾರಂತರ "ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ" ಲೇಖನ ಯಾವ ರೀತಿ ಯಾಗಿದೆ?
 ಅ) ವಿಡಂಬನೆ
 ಬ) ನಾಟಕ
 ಕ) ಪ್ರವಾಸ ಕಥನ
 ಡ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ
20. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ವ್ಯಕ್ತಿತ್ವಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳುವಂತದ್ದು :
 ಅ) ಶಿಸ್ತು
 ಬ) ಪಾಶ್ಚಾತ್ಯ ದಿರಿಸು
 ಕ) ಹೊಣೆಗಾರಿಕೆ
 ಡ) ಮೇಲಿನ ಎಲ್ಲವು
21. 'ಸುಖ' ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ :
 ಅ) ದುಃಖ
 ಬ) ನಲಿವು
 ಕ) ಸಂತೋಷ
 ಡ) ಒಲವು

22. 'ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?' ಲೇಖನ ಯಾವ ರೀತಿಯಲ್ಲಿದೆ?
 ಅ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ ಬ) ವಿನೋದ ಲೇಖನ
 ಕ) ಪತ್ರಿಕಾ ಅಂಕಣ ಡ) ನಾಟಕ
23. ಶ್ರೀ ಪಿ.ಲಂಕೇಶ 'ಗುಬ್ಬಚ್ಚಿಗೂಡು' ಲೇಖನದಲ್ಲಿ ಚಿಂತಿಸಿರುವುದು :
 ಅ) ಭಟ್ಟಂಗಿಗಳ ಬದುಕು ಬ) ದೀನತೆಯ ಬದುಕು
 ಕ) ಸ್ವಂತಿಕೆಯ ಬದುಕು ಡ) ಅಸಮಾನತೆಯ ಬದುಕು
24. 'ಜನ' ಯಾವ ಲಿಂಗ
 ಅ) ಸ್ತ್ರೀ ಲಿಂಗ ಬ) ಪುಲ್ಲಿಂಗ
 ಕ) ಅಲಿಂಗ ಡ) ನಪುಂಸಕಲಿಂಗ
25. 'ಅಂಬಿಕಾತನಯದತ್ತ' ಕಾವ್ಯನಾಮದ ಕವಿ :
 ಅ) ದ.ರಾ. ಬೇಂದ್ರೆ ಬ) ಕೆ.ವಿ.ಪುಟ್ಟಪ್ಪ
 ಕ) ವಿ.ಕೃ.ಗೋಕಾಕ ಡ) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
26. ಕನ್ನಡಕ್ಕೆ ಸಂದಿರುವ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿಗಳು :
 ಅ) ೧೦ ಬ) ೮
 ಕ) ೭ ಡ) ೯
27. 'ಶ್ರಾವಣ' ಕವನದಲ್ಲಿ ಕವಿ ಯಾವುದರ ಸೌಂದರ್ಯವನ್ನು ವರ್ಣಿಸಿದ್ದಾರೆ?
 ಅ) ಧಾರವಾಡದ ಬ) ಬೆಂಗಳೂರಿನ
 ಕ) ನಿಸರ್ಗದ ಡ) ಬೆಳಗಾವಿಯ
28. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಮೊದಲಬಾರಿ ಜೋಗ ಜಲಪಾತದ ಎದುರು ನಿಂತಾಗ ಹೇಳಿದ್ದು:
 ಅ) ಎಷ್ಟೊಂದು ಬೆಳೆ ಪೋಲಾಗುತ್ತಿದೆ
 ಬ) ಎಷ್ಟೊಂದು ಸಮಯ ಪೋಲಾಗುತ್ತಿದೆ
 ಕ) ಎಷ್ಟೊಂದು ಹಣ ಪೋಲಾಗುತ್ತಿದೆ
 ಡ) ಎಷ್ಟೊಂದು ಶಕ್ತಿ ಪೋಲಾಗುತ್ತಿದೆ
29. ಶ್ರೀ ಕುವೆಂಪುರವರ ಲೇಖನ ಯಾವ ಭಾಗದ ಚಿತ್ರಣವನ್ನು ನೀಡುತ್ತದೆ?
 ಅ) ಮಲೆನಾಡು ಬ) ಕರಾವಳಿ
 ಕ) ಮರುಭೂಮಿ ಡ) ದೊಡ್ಡನಗರ ಪ್ರದೇಶ
30. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಭಾಷಣಕ್ಕೆ ಯಾವುದು ಸರಿಹೊಂದುವುದಿಲ್ಲ?
 ಅ) ಆಲೋಚನೆಯಲ್ಲಿ ಸತ್ಯನಿಷ್ಠೆ.
 ಬ) ಹಾವಭಾವ-ಮಾತಿನ ಮಂಟಪದಲ್ಲಿ ಜನರನ್ನು ಮರಳುಮಾಡುವುದು.
 ಕ) ಭಾಷಣದ ಕುರಿತು ತಯಾರಿ
 ಡ) ಶೋತೃವರ್ಗಕ್ಕೆ ಗೌರವ

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Question Paper Version : D

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

ಕನ್ನಡ ಮನಸು

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

ಸೂಚನೆಗಳು

1. ಎಲ್ಲ ೩೦ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರಿಸಿರಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.
2. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯು.ಎಸ್.ಎನ್ ಸಂಖ್ಯೆ ಹಾಗೂ ಪಶ್ಚಿಮ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ಅಂದರೆ A, B, C ಅಥವಾ D ಯನ್ನು ತಪ್ಪಿಲ್ಲದಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಗುರುತಿಸುವುದು ಅಭ್ಯರ್ಥಿಯ ಜವಾಬ್ದಾರಿಯಾಗಿರುತ್ತದೆ.
3. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವ ಸ್ಥಳದಲ್ಲಿ ಭರ್ತಿಮಾಡದೆ ಹಾಗೆಯೇ ಬಿಟ್ಟಲ್ಲಿ ಅಥವಾ ಭರ್ತಿಮಾಡಿದ ಮಾಹಿತಿಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಅಂತಹ ಉತ್ತರ ಪತ್ರಿಕೆಗಳನ್ನು ರದ್ದು ಪಡಿಸಲಾಗುವುದು.
4. ಕೇವಲ ಒಂದು ಉತ್ತರವನ್ನು ಮಾತ್ರ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಗುರುತಿಸತಕ್ಕದ್ದು. ಒಂದೆ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಉತ್ತರವನ್ನು ಗುರುತಿಸುವುದು ಅಮಾನ್ಯ.
5. ಎಲ್ಲಾ ಉತ್ತರಗಳನ್ನು ನಿಮಗೆ ಒದಗಿಸಲಾದ ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯ ಹಾಳೆಯ ಮೇಲೆ ಕಷ್ಟ ಅಥವಾ ನೀಲಿ ಶಾಹಿಯ ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಗುರುತು ಮಾಡಬೇಕು.

1. ಶ್ರೀ ಸಿದ್ಧಲಿಂಗಯ್ಯನವರ 'ಬೆಳ್ಳಿಯ ಹಾಡು' ಕವನದಲ್ಲಿ ಕಂಡುಬರುವ ಅಂಶ :
ಅ) ಸಮಾಜದ ಸುಸ್ಥಿತಿ ಬ) ಪ್ರೇಮದ ರಮ್ಯತೆ
ಕ) ಭಕ್ತಿಯ ಪರವಶತೆ ಡ) ದಲಿತರ ಕನಸು
2. 'ಒಲೆಹತ್ತಿ ಉರಿದಡೆ ನಿಲಬಹುದಲ್ಲದೇ, ಧರೆಹತ್ತಿ ಉರಿದರೆ ನಿಲಬಾರದು, ಏರಿ ನೀರುಂಬಡೆ ಬೇಲಿ ಹೊಲದ ಮೇವೊಡೆ, ನಾರಿ ತನ್ನ ಮನೆಯಲ್ಲಿ ಕಳುವೊಡೆ, ತಾಯಿಯ ಮೊಲೆಹಾಲು ನಂಜಾಗಿ ಕೊಲವುಡೆ ಇನ್ನಾರಿಗೆ ದೂರುಪೆ ಕೂಡಲ ಸಂಗಮದೇವಾ' ಈ ವಚನದ ರಚನಕಾರರು:
ಅ) ಸರ್ವಜ್ಞ ಬ) ಚಾಮರಸ
ಕ) ಅಲ್ಲಮಪ್ರಭು ಡ) ಬಸವಣ್ಣ
3. ಮಲೆಮಾದೇಶ್ವರ ಬೆಟ್ಟವಿರುವ ಸ್ಥಳ:
ಅ) ಅರಿಶಿನಕುಂಟೆ ಬ) ಅಥಣಿ
ಕ) ಅಘಜಲಪುರ ಡ) ಕೊಳ್ಳೆಗಾಲ

4. 'ಶ್ರೀ ಸಂಗೊಳ್ಳಿ ರಾಯಣ್ಣ' ಯಾರು?
 ಅ) ಅದ್ಭುತ ಭಾಷಣಕಾರ ಬ) ವಂದಿಮಾಗಧರಿಗೆ ಸೇರಿದವನು
 ಕ) ಬ್ಯಾಂಕಗಳಿಗೆ ಮೋಸ ಮಾಡಿದವನು ಡ) ಬ್ರಿಟಿಷರ ವಿರುದ್ಧ ಹೋರಾಡಿದ ಹೋರಾಟಗಾರ
5. ಮೊದಲು ಕನ್ನಡಕ್ಕೊಂದು ಅಪರೂಪ ನಿಘಂಟನ್ನು ರಚಿಸಿಕೊಟ್ಟವರು:
 ಅ) ಪಂಪ ಬ) ಹರಿಹರ
 ಕ) ಮೆಕಾಲೆ ಡ) ಕಿಟ್ಟೆಲ್
6. 'ಕನ್ನಡ ಸಂಸ್ಕೃತಿ' ಈ ರೀತಿಯಾಗಿದೆ :
 ಅ) ಬಹುರೂಪಿಯಾಗಿದೆ ಬ) ವರ್ಣರಂಜಿತವಾಗಿದೆ
 ಕ) ಜೀವಂತವಾಗಿದೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
7. ಪತ್ರ ವ್ಯವಹಾರ - ಮನವಿಗಳಲ್ಲಿ ಇರಬೇಕಾದದ್ದು :
 ಅ) ಸ್ಪಷ್ಟ ಮಾಹಿತಿ ಬ) ನೇರ ನಿರೂಪಣೆ
 ಕ) ಸೌಜನ್ಯ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
8. ಸಚಿವ + ಆಲಯ = ಸಚಿವಾಲಯ, ಇಲ್ಲಿರುವ ಸಂಧಿ :
 ಅ) ಸುವರ್ಣ ಸಂಧಿ ಬ) ಸರ್ವಧೀರ್ಘ ಸಂಧಿ
 ಕ) ರಾಜಯೋಗ ಸಂಧಿ ಡ) ವೃದ್ಧಿ ಸಂಧಿ
9. 'ವಿಶ್ವ ಮಾನವತೆ' ಎನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ಕಂದಾಚಾರ ಬ) ಮೂಢನಂಬಿಕೆ
 ಕ) ಸಾಮರಸ್ಯ-ಸಹಿಷ್ಣುತೆ ಡ) ಮತೀಯ ದ್ವೇಷ
10. 'ಪಡುವಣ' ಪದದ ವಿರುದ್ಧಾರ್ಥಕ ಪದ
 ಅ) ಕೊಂಕಣ ಬ) ಬಡಗಣ
 ಕ) ತೆಂಕಣ ಡ) ಮೂಡಣ
11. 'ನಾನು ನಿನ್ನೆ ಕೆ.ಜಿ.ಎಫ್‌ಗೆ ಹೋಗಿದ್ದೆನು' ಈ ವಾಕ್ಯದಲ್ಲಿರುವ ಕಾಲ :
 ಅ) ಭೂತ ಕಾಲ ಬ) ರಾಜಯೋಗ ಕಾಲ
 ಕ) ಯಮಗಂಡ ಕಾಲ ಡ) ರಾಹು ಕಾಲ
12. 'ಫೋಟೋಗ್ರಾಫಿ' ಪದಕ್ಕೆ ಸಮನಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ವರ್ಣ ಚಿತ್ರ ಬ) ಛಾಯಾ ಚಿತ್ರ
 ಕ) ತೈಲ ಚಿತ್ರ ಡ) ಚಲನ ಚಿತ್ರ
13. 'ಬೆಣ್ಣೆ ಹಚ್ಚು' ಪದದ ಸರಿಯಾದ ಅರ್ಥ:
 ಅ) ರೊಟ್ಟಿಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು ಬ) ದೋಸೆಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು
 ಕ) ಹೊಗಳುವುದು ಡ) ರಾಗಿಮುದ್ದೆಗೆ ಬೆಣ್ಣೆ

14. 'ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು' ಕವನ ಯಾವುದರ ಕುರಿತಾಗಿದೆ?
 ಅ) ಸಂಪ್ರದಾಯಗಳಿಗಿಂತಲು ಮಿಗಿಲಾಗಿರುವುದು ಮಹಿಳೆಯ ಘನತೆ.
 ಬ) ಮಹಿಳಾ ಮೀಸಲಾತಿ
 ಕ) ಸಮಾನತೆಗಾಗಿ ಚಳುವಳಿ
 ಡ) ಕನಸಿನ ಮದುವೆ
15. ಶ್ರೀ 'ಬಂದೇ ನವಾಜ್' ಯಾರು?
 ಅ) ಗುಲಬರ್ಗಾದ ಸೂಫಿ ಸಂತರು
 ಬ) ಬ್ರಿಟಿಶರಿಂದ ಉಂಬಳಿ ಪಡೆದವರು
 ಕ) ವಜ್ರ ವ್ಯಾಪಾರಿಗಳು
 ಡ) ಗಣಿ ಧಣಿ
16. 'ರೆಹಮಾನರ ಹಾಡಿನ ಕಂಪೋಷನ ಚೆನ್ನಾಗಿದೆ' ಎನ್ನುವ ವಾಕ್ಯದಲ್ಲಿ ಕಂಪೋಷನ ಪದಕ್ಕೆ ಸರಿಯಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ಧ್ವನಿ ಸಂಪತ್ತು
 ಬ) ಸಂಯೋಜನೆ
 ಕ) ನಿರ್ದೇಶನ
 ಡ) ಕಂಠದಾನ
17. 'ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು' ಲೇಖನದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಪ್ರವಾಸದ ಉದ್ದೇಶ :
 ಅ) ಆನೆ ದಂತ ಸಂಗ್ರಹಣೆ
 ಬ) ಖೆಡ್ಡಾಗಳ ಕುರಿತು ಅಧ್ಯಯನ
 ಕ) ಸಸ್ಯ ವೀಕ್ಷಣೆ
 ಡ) ಹುಲಿ ವೀಕ್ಷಣೆ
18. ಡಾ|| ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣನವರ 'ಗಾಂಧಿ' ಕಥೆ ಏನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ವರ್ಣಾಶ್ರಮ ಪದ್ಧತಿ
 ಬ) ಜಾತೀಯತೆ
 ಕ) ಮುಢ ನಂಬಿಕೆ
 ಡ) ಮಹಾತ್ಮ ಗಾಂಧೀಜಿಯವರ ಮೌಲ್ಯಗಳಿಗೆ ಒದಗಿರುವ ಅವಸ್ಥೆಯನ್ನು
19. ಶ್ರೀ ಶಿವರಾಮ ಕಾರಂತರ "ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ" ಲೇಖನ ಯಾವ ರೀತಿ ಯಾಗಿದೆ?
 ಅ) ವಿಡಂಬನೆ
 ಬ) ನಾಟಕ
 ಕ) ಪ್ರವಾಸ ಕಥನ
 ಡ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ
20. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ವ್ಯಕ್ತಿತ್ವಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳುವಂತದ್ದು :
 ಅ) ಶಿಸ್ತು
 ಬ) ಪಾಶ್ಚಾತ್ಯ ದಿರಿಸು
 ಕ) ಹೊಣೆಗಾರಿಕೆ
 ಡ) ಮೇಲಿನ ಎಲ್ಲವು
21. 'ಸುಖ' ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ :
 ಅ) ದುಃಖ
 ಬ) ನಲಿವು
 ಕ) ಸಂತೋಷ
 ಡ) ಒಲವು

22. 'ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?' ಲೇಖನ ಯಾವ ರೀತಿಯಲ್ಲಿದೆ?
 ಅ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ ಬ) ವಿನೋದ ಲೇಖನ
 ಕ) ಪತ್ರಿಕಾ ಅಂಕಣ ಡ) ನಾಟಕ
23. ಶ್ರೀ ಪಿ.ಲಂಕೇಶ 'ಗುಬ್ಬಚ್ಚಿಗೂಡು' ಲೇಖನದಲ್ಲಿ ಚಿಂತಿಸಿರುವುದು :
 ಅ) ಭಟ್ಟಂಗಿಗಳ ಬದುಕು ಬ) ದೀನತೆಯ ಬದುಕು
 ಕ) ಸ್ವಂತಿಕೆಯ ಬದುಕು ಡ) ಅಸಮಾನತೆಯ ಬದುಕು
24. 'ಜನ' ಯಾವ ಲಿಂಗ
 ಅ) ಸ್ತ್ರೀ ಲಿಂಗ ಬ) ಪುಲ್ಲಿಂಗ
 ಕ) ಅಲಿಂಗ ಡ) ನಪುಂಸಕಲಿಂಗ
25. 'ಅಂಬಿಕಾತನಯದತ್ತ' ಕಾವ್ಯನಾಮದ ಕವಿ :
 ಅ) ದ.ರಾ. ಬೇಂದ್ರೆ ಬ) ಕೆ.ವಿ.ಪುಟ್ಟಪ್ಪ
 ಕ) ವಿ.ಕೃ.ಗೋಕಾಕ ಡ) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
26. ಕನ್ನಡಕ್ಕೆ ಸಂದಿರುವ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿಗಳು :
 ಅ) ೧೦ ಬ) ೮
 ಕ) ೭ ಡ) ೯
27. 'ಶ್ರಾವಣ' ಕವನದಲ್ಲಿ ಕವಿ ಯಾವುದರ ಸೌಂದರ್ಯವನ್ನು ವರ್ಣಿಸಿದ್ದಾರೆ?
 ಅ) ಧಾರವಾಡದ ಬ) ಬೆಂಗಳೂರಿನ
 ಕ) ನಿಸರ್ಗದ ಡ) ಬೆಳಗಾವಿಯ
28. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಮೊದಲಬಾರಿ ಜೋಗ ಜಲಪಾತದ ಎದುರು ನಿಂತಾಗ ಹೇಳಿದ್ದು:
 ಅ) ಎಷ್ಟೊಂದು ಬೆಳೆ ಪೋಲಾಗುತ್ತಿದೆ
 ಬ) ಎಷ್ಟೊಂದು ಸಮಯ ಪೋಲಾಗುತ್ತಿದೆ
 ಕ) ಎಷ್ಟೊಂದು ಹಣ ಪೋಲಾಗುತ್ತಿದೆ
 ಡ) ಎಷ್ಟೊಂದು ಶಕ್ತಿ ಪೋಲಾಗುತ್ತಿದೆ
29. ಶ್ರೀ ಕುವೆಂಪುರವರ ಲೇಖನ ಯಾವ ಭಾಗದ ಚಿತ್ರಣವನ್ನು ನೀಡುತ್ತದೆ?
 ಅ) ಮಲೆನಾಡು ಬ) ಕರಾವಳಿ
 ಕ) ಮರುಭೂಮಿ ಡ) ದೊಡ್ಡನಗರ ಪ್ರದೇಶ
30. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಬಾಷಣಕ್ಕೆ ಯಾವುದು ಸರಿಹೊಂದುವುದಿಲ್ಲ?
 ಅ) ಆಲೋಚನೆಯಲ್ಲಿ ಸತ್ಯನಿಷ್ಠೆ.
 ಬ) ಹಾವಭಾವ-ಮಾತಿನ ಮಂಟಪದಲ್ಲಿ ಜನರನ್ನು ಮರಳುಮಾಡುವುದು.
 ಕ) ಭಾಷಣದ ಕುರಿತು ತಯಾರಿ
 ಡ) ಶೋತೃವರ್ಗಕ್ಕೆ ಗೌರವ

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4. 'ಶ್ರೀ ಸಂಗೊಳ್ಳಿ ರಾಯಣ್ಣ' ಯಾರು?
 ಅ) ಅದ್ಭುತ ಭಾಷಣಕಾರ ಬ) ವಂದಿಮಾಗಧರಿಗೆ ಸೇರಿದವನು
 ಕ) ಬ್ಯಾಂಕಗಳಿಗೆ ಮೋಸ ಮಾಡಿದವನು ಡ) ಬ್ರಿಟಿಷರ ವಿರುದ್ಧ ಹೋರಾಡಿದ ಹೋರಾಟಗಾರ
5. ಮೊದಲು ಕನ್ನಡಕ್ಕೊಂದು ಅಪರೂಪ ನಿಘಂಟನ್ನು ರಚಿಸಿಕೊಟ್ಟವರು:
 ಅ) ಪಂಪ ಬ) ಹರಿಹರ
 ಕ) ಮೆಕಾಲೆ ಡ) ಕಿಟ್ಟೆಲ್
6. 'ಕನ್ನಡ ಸಂಸ್ಕೃತಿ' ಈ ರೀತಿಯಾಗಿದೆ :
 ಅ) ಬಹುರೂಪಿಯಾಗಿದೆ ಬ) ವರ್ಣರಂಜಿತವಾಗಿದೆ
 ಕ) ಜೀವಂತವಾಗಿದೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
7. ಪತ್ರ ವ್ಯವಹಾರ - ಋನವಿಗಳಲ್ಲಿ ಇರಬೇಕಾದದ್ದು :
 ಅ) ಸ್ಪಷ್ಟ ಮಾಹಿತಿ ಬ) ನೇರ ನಿರೂಪಣೆ
 ಕ) ಸೌಜನ್ಯ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
8. ಸಚಿವ + ಆಲಯ = ಸಚಿವಾಲಯ, ಇಲ್ಲಿರುವ ಸಂಧಿ :
 ಅ) ಸುವರ್ಣ ಸಂಧಿ ಬ) ಸರ್ವ ಧೀರ್ಘ ಸಂಧಿ
 ಕ) ರಾಜಯೋಗ ಸಂಧಿ ಡ) ವೃದ್ಧಿ ಸಂಧಿ
9. 'ವಿಶ್ವ ಮಾನವತೆ' ಎನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ಕಂದಾಚಾರ ಬ) ಮೂಢನಂಬಿಕೆ
 ಕ) ಸಾಮರಸ್ಯ-ಸಹಿಷ್ಣುತೆ ಡ) ಮತೀಯ ದ್ವೇಷ
10. 'ಪಡುವಣ' ಪದದ ವಿರುದ್ಧಾರ್ಥಕ ಪದ
 ಅ) ಕೊಂಕಣ ಬ) ಬಡಗಣ
 ಕ) ತೆಂಕಣ ಡ) ಮೂಡಣ
11. 'ನಾನು ನಿನ್ನೆ ಕೆ.ಜಿ.ಎಫ್‌ಗೆ ಹೋಗಿದ್ದೆನು' ಈ ವಾಕ್ಯದಲ್ಲಿರುವ ಕಾಲ :
 ಅ) ಭೂತ ಕಾಲ ಬ) ರಾಜಯೋಗ ಕಾಲ
 ಕ) ಯಮಗಂಡ ಕಾಲ ಡ) ರಾಹು ಕಾಲ
12. 'ಫೋಟೋಗ್ರಾಫಿ' ಪದಕ್ಕೆ ಸಮನಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ವರ್ಣ ಚಿತ್ರ ಬ) ಛಾಯಾ ಚಿತ್ರ
 ಕ) ತೈಲ ಚಿತ್ರ ಡ) ಚಲನ ಚಿತ್ರ
13. 'ಬೆಣ್ಣೆ ಹಚ್ಚು' ಪದದ ಸರಿಯಾದ ಅರ್ಥ:
 ಅ) ರೊಟ್ಟಿಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು ಬ) ದೋಸೆಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು
 ಕ) ಹೊಗಳುವುದು ಡ) ರಾಗಿಮುದ್ದೆಗೆ ಬೆಣ್ಣೆ

14. 'ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು' ಕವನ ಯಾವುದರ ಕುರಿತಾಗಿದೆ?
 ಅ) ಸಂಪ್ರದಾಯಗಳಿಗಿಂತಲು ಮಿಗಿಲಾಗಿರುವುದು ಮಹಿಳೆಯ ಘನತೆ.
 ಬ) ಮಹಿಳಾ ಮೀಸಲಾತಿ
 ಕ) ಸಮಾನತೆಗಾಗಿ ಚಳುವಳಿ
 ಡ) ಕನಸಿನ ಮದುವೆ
15. ಶ್ರೀ 'ಬಂದೇ ನವಾಜ್' ಯಾರು?
 ಅ) ಗುಲಬರ್ಗಾದ ಸೂಫಿ ಸಂತರು
 ಬ) ಬ್ರಿಟಿಶರಿಂದ ಉಂಬಳಿ ಪಡೆದವರು
 ಕ) ವಜ್ರ ವ್ಯಾಪಾರಿಗಳು
 ಡ) ಗಣಿ ಧಣಿ
16. 'ರೆಹಮಾನರ ಹಾಡಿನ ಕಂಪೋಷಿಸನ ಚೆನ್ನಾಗಿದೆ' ಎನ್ನುವ ವಾಕ್ಯದಲ್ಲಿ ಕಂಪೋಷಿಸನ ಪದಕ್ಕೆ ಸರಿಯಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ಧ್ವನಿ ಸಂಪತ್ತು
 ಬ) ಸಂಯೋಜನೆ
 ಕ) ನಿರ್ದೇಶನ
 ಡ) ಕಂಠದಾನ
17. 'ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು' ಲೇಖನದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಪ್ರವಾಸದ ಉದ್ದೇಶ :
 ಅ) ಆನೆ ದಂತ ಸಂಗ್ರಹಣೆ
 ಬ) ಖೆಡ್ಡಾಗಳ ಕುರಿತು ಅಧ್ಯಯನ
 ಕ) ಸಸ್ಯ ವೀಕ್ಷಣೆ
 ಡ) ಹುಲಿ ವೀಕ್ಷಣೆ
18. ಡಾ|| ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣನವರ 'ಗಾಂಧಿ' ಕಥೆ ಏನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ವರ್ಣಾಶ್ರಮ ಪದ್ಧತಿ
 ಬ) ಜಾತೀಯತೆ
 ಕ) ಮುಢ ನಂಬಿಕೆ
 ಡ) ಮಹಾತ್ಮ ಗಾಂಧೀಜಿಯವರ ಮೌಲ್ಯಗಳಿಗೆ ಒದಗಿರುವ ಅವಸ್ಥೆಯನ್ನು
19. ಶ್ರೀ ಶಿವರಾಮ ಕಾರಂತರ "ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ" ಲೇಖನ ಯಾವ ರೀತಿ ಯಾಗಿದೆ?
 ಅ) ವಿಡಂಬನೆ
 ಬ) ನಾಟಕ
 ಕ) ಪ್ರವಾಸ ಕಥನ
 ಡ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ
20. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ವ್ಯಕ್ತಿತ್ವಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳುವಂತದ್ದು :
 ಅ) ಶಿಸ್ತು
 ಬ) ಪಾಶ್ಚಾತ್ಯ ದಿರಿಸು
 ಕ) ಹೊಣೆಗಾರಿಕೆ
 ಡ) ಮೇಲಿನ ಎಲ್ಲವು
21. 'ಸುಖ' ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ :
 ಅ) ದುಃಖ
 ಬ) ನಲಿವು
 ಕ) ಸಂತೋಷ
 ಡ) ಒಲವು

22. 'ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?' ಲೇಖನ ಯಾವ ರೀತಿಯಲ್ಲಿದೆ?
 ಅ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ ಬ) ವಿನೋದ ಲೇಖನ
 ಕ) ಪತ್ರಿಕಾ ಅಂಕಣ ಡ) ನಾಟಕ
23. ಶ್ರೀ ಪಿ.ಲಂಕೇಶ 'ಗುಬ್ಬಚ್ಚಿಗೂಡು' ಲೇಖನದಲ್ಲಿ ಚಿಂತಿಸಿರುವುದು :
 ಅ) ಭಟ್ಟಂಗಿಗಳ ಬದುಕು ಬ) ದೀನತೆಯ ಬದುಕು
 ಕ) ಸ್ವಂತಿಕೆಯ ಬದುಕು ಡ) ಅಸಮಾನತೆಯ ಬದುಕು
24. 'ಜನ' ಯಾವ ಲಿಂಗ
 ಅ) ಸ್ತ್ರೀ ಲಿಂಗ ಬ) ಪುಲ್ಲಿಂಗ
 ಕ) ಅಲಿಂಗ ಡ) ನಪುಂಸಕಲಿಂಗ
25. 'ಅಂಬಿಕಾತನಯದತ್ತ' ಕಾವ್ಯನಾಮದ ಕವಿ :
 ಅ) ದ.ರಾ. ಬೇಂದ್ರೆ ಬ) ಕೆ.ವಿ.ಪುಟ್ಟಪ್ಪ
 ಕ) ವಿ.ಕೃ.ಗೋಕಾಕ ಡ) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
26. ಕನ್ನಡಕ್ಕೆ ಸಂದಿರುವ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿಗಳು :
 ಅ) ೧೦ ಬ) ೮
 ಕ) ೭ ಡ) ೯
27. 'ಶ್ರಾವಣ' ಕವನದಲ್ಲಿ ಕವಿ ಯಾವುದರ ಸೌಂದರ್ಯವನ್ನು ವರ್ಣಿಸಿದ್ದಾರೆ?
 ಅ) ಧಾರವಾಡದ ಬ) ಬೆಂಗಳೂರಿನ
 ಕ) ನಿಸರ್ಗದ ಡ) ಬೆಳಗಾವಿಯ
28. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಮೊದಲಬಾರಿ ಜೋಗ ಜಲಪಾತದ ಎದುರು ನಿಂತಾಗ ಹೇಳಿದ್ದು:
 ಅ) ಎಷ್ಟೊಂದು ಬೆಳೆ ಪೋಲಾಗುತ್ತಿದೆ
 ಬ) ಎಷ್ಟೊಂದು ಸಮಯ ಪೋಲಾಗುತ್ತಿದೆ
 ಕ) ಎಷ್ಟೊಂದು ಹಣ ಪೋಲಾಗುತ್ತಿದೆ
 ಡ) ಎಷ್ಟೊಂದು ಶಕ್ತಿ ಪೋಲಾಗುತ್ತಿದೆ
29. ಶ್ರೀ ಕುವೆಂಪುರವರ ಲೇಖನ ಯಾವ ಭಾಗದ ಚಿತ್ರಣವನ್ನು ನೀಡುತ್ತದೆ?
 ಅ) ಮಲೆನಾಡು ಬ) ಕರಾವಳಿ
 ಕ) ಮರುಭೂಮಿ ಡ) ದೊಡ್ಡನಗರ ಪ್ರದೇಶ
30. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಬಾಷಣಕ್ಕೆ ಯಾವುದು ಸರಿಹೊಂದುವುದಿಲ್ಲ?
 ಅ) ಆಲೋಚನೆಯಲ್ಲಿ ಸತ್ಯನಿಷ್ಠೆ.
 ಬ) ಹಾವಭಾವ-ಮಾತಿನ ಮಂಟಪದಲ್ಲಿ ಜನರನ್ನು ಮರಳುಮಾಡುವುದು.
 ಕ) ಭಾಷಣದ ಕುರಿತು ತಯಾರಿ
 ಡ) ಶೋತೃವರ್ಗಕ್ಕೆ ಗೌರವ

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

ಕನ್ನಡ ಮನಸು

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

ಸೂಚನೆಗಳು

1. ಎಲ್ಲ ೩೦ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರಿಸಿರಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.
2. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯು.ಎಸ್.ಎನ್ ಸಂಖ್ಯೆ ಹಾಗೂ ಪಶ್ಚಿಮ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ಅಂದರೆ A, B, C ಅಥವಾ D ಯನ್ನು ತಪ್ಪಿಲ್ಲದಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಗುರುತಿಸುವುದು ಅಭ್ಯರ್ಥಿಯ ಜವಾಬ್ದಾರಿಯಾಗಿರುತ್ತದೆ.
3. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವ ಸ್ಥಳದಲ್ಲಿ ಭರ್ತಿಮಾಡದೆ ಹಾಗೆಯೇ ಬಿಟ್ಟಲ್ಲಿ ಅಥವಾ ಭರ್ತಿಮಾಡಿದ ಮಾಹಿತಿಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಅಂತಹ ಉತ್ತರ ಪತ್ರಿಕೆಗಳನ್ನು ರದ್ದು ಪಡಿಸಲಾಗುವುದು.
4. ಕೇವಲ ಒಂದು ಉತ್ತರವನ್ನು ಮಾತ್ರ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಗುರುತಿಸತಕ್ಕದ್ದು. ಒಂದೆ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಉತ್ತರವನ್ನು ಗುರುತಿಸುವುದು ಅಮಾನ್ಯ.
5. ಎಲ್ಲಾ ಉತ್ತರಗಳನ್ನು ನಿಮಗೆ ಒದಗಿಸಲಾದ ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯ ಹಾಳೆಯ ಮೇಲೆ ಕಪ್ಪು ಅಥವಾ ನೀಲಿ ಶಾಹಿಯ ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಗುರುತು ಮಾಡಬೇಕು.

1. ಶ್ರೀ ಸಿದ್ಧಲಿಂಗಯ್ಯನವರ 'ಬೆಳ್ಳಿಯ ಹಾಡು' ಕವನದಲ್ಲಿ ಕಂಡುಬರುವ ಅಂಶ :
ಅ) ಸಮಾಜದ ಸುಸ್ಥಿತಿ ಬ) ಪ್ರೇಮದ ರಮ್ಯತೆ
ಕ) ಭಕ್ತಿಯ ಪರವಶತೆ ಡ) ದಲಿತರ ಕನಸು
2. 'ಒಲೆಹತ್ತಿ ಉರಿದಡೆ ನಿಲಬಹುದಲ್ಲದೇ, ಧರೆಹತ್ತಿ ಉರಿದರೆ ನಿಲಬಾರದು, ಏರಿ ನೀರುಂಬಡೆ ಬೇಲಿ ಹೊಲದ ಮೇವೊಡೆ, ನಾರಿ ತನ್ನ ಮನೆಯಲ್ಲಿ ಕಳುವೊಡೆ, ತಾಯಿಯ ಮೊಲೆಹಾಲು ನಂಜಾಗಿ ಕೊಲವುಡೆ ಇನ್ನಾರಿಗೆ ದೂರುವೆ ಕೂಡಲ ಸಂಗಮದೇವಾ' ಈ ವಚನದ ರಚನೆಕಾರರು:
ಅ) ಸರ್ವಜ್ಞ ಬ) ಚಾಮರಸ
ಕ) ಅಲ್ಲಮಪ್ರಭು ಡ) ಬಸವಣ್ಣ
3. ಮಲೆಮಾದೇಶ್ವರ ಬೆಟ್ಟವಿರುವ ಸ್ಥಳ:
ಅ) ಅರಿಶಿನಕುಂಟೆ ಬ) ಅಥಣಿ
ಕ) ಅಘಜಲಪುರ ಡ) ಕೊಳ್ಳೆಗಾಲ

4. 'ಶ್ರೀ ಸಂಗೊಳ್ಳಿ ರಾಯಣ್ಣ' ಯಾರು?
 ಅ) ಅದ್ಭುತ ಭಾಷಣಕಾರ ಬ) ವಂದಿಮಾಗಧರಿಗೆ ಸೇರಿದವನು
 ಕ) ಬ್ಯಾಂಕಗಳಿಗೆ ಮೋಸ ಮಾಡಿದವನು ಡ) ಬ್ರಿಟಿಷರ ವಿರುದ್ಧ ಹೋರಾಡಿದ ಹೋರಾಟಗಾರ
5. ಮೊದಲು ಕನ್ನಡಕ್ಕೊಂದು ಅಪರೂಪ ನಿಘಂಟನ್ನು ರಚಿಸಿಕೊಟ್ಟವರು:
 ಅ) ಪಂಪ ಬ) ಹರಿಹರ
 ಕ) ಮೆಕಾಲೆ ಡ) ಕಿಟ್ಟೆಲ್
6. 'ಕನ್ನಡ ಸಂಸ್ಕೃತಿ' ಈ ರೀತಿಯಾಗಿದೆ :
 ಅ) ಬಹುರೂಪಿಯಾಗಿದೆ ಬ) ವರ್ಣರಂಜಿತವಾಗಿದೆ
 ಕ) ಜೀವಂತವಾಗಿದೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
7. ಪತ್ರ ವ್ಯವಹಾರ - ಮನವಿಗಳಲ್ಲಿ ಇರಬೇಕಾದದ್ದು :
 ಅ) ಸೃಷ್ಟಿ ಮಾಹಿತಿ ಬ) ನೇರ ನಿರೂಪಣೆ
 ಕ) ಸೌಜನ್ಯ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
8. ಸಚಿವ + ಆಲಯ = ಸಚಿವಾಲಯ, ಇಲ್ಲಿರುವ ಸಂಧಿ :
 ಅ) ಸುವರ್ಣ ಸಂಧಿ ಬ) ಸರ್ವಣ ಧೀರ್ಘ ಸಂಧಿ
 ಕ) ರಾಜಯೋಗ ಸಂಧಿ ಡ) ವೃದ್ಧಿ ಸಂಧಿ
9. 'ವಿಶ್ವ ಮಾನವತೆ' ಎನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ಕಂದಾಚಾರ ಬ) ಮೂಢನಂಬಿಕೆ
 ಕ) ಸಾಮರಸ್ಯ-ಸಹಿಷ್ಣುತೆ ಡ) ಮತೀಯ ದ್ವೇಷ
10. 'ಪಡುವಣ' ಪದದ ವಿರುದ್ಧಾರ್ಥಕ ಪದ
 ಅ) ಕೊಂಕಣ ಬ) ಬಡಗಣ
 ಕ) ತೆಂಕಣ ಡ) ಮೂಡಣ
11. 'ನಾನು ನಿನ್ನೆ ಕೆ.ಜಿ.ಎಫ್‌ಗೆ ಹೋಗಿದ್ದೆನು' ಈ ವಾಕ್ಯದಲ್ಲಿರುವ ಕಾಲ :
 ಅ) ಭೂತ ಕಾಲ ಬ) ರಾಜಯೋಗ ಕಾಲ
 ಕ) ಯಮಗಂಡ ಕಾಲ ಡ) ರಾಹು ಕಾಲ
12. 'ಫೋಟೋಗ್ರಾಫಿ' ಪದಕ್ಕೆ ಸಮನಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ವರ್ಣ ಚಿತ್ರ ಬ) ಛಾಯಾ ಚಿತ್ರ
 ಕ) ತೈಲ ಚಿತ್ರ ಡ) ಚಲನ ಚಿತ್ರ
13. 'ಬೆಣ್ಣೆ ಹಚ್ಚು' ಪದದ ಸರಿಯಾದ ಅರ್ಥ:
 ಅ) ರೊಟ್ಟಿಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು ಬ) ದೋಸೆಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು
 ಕ) ಹೊಗಳುವುದು ಡ) ರಾಗಿಮುದ್ದೆಗೆ ಬೆಣ್ಣೆ

14. 'ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು' ಕವನ ಯಾವುದರ ಕುರಿತಾಗಿದೆ?
 ಅ) ಸಂಪ್ರದಾಯಗಳಿಗಿಂತಲು ಮಿಗಿಲಾಗಿರುವುದು ಮಹಿಳೆಯ ಘನತೆ.
 ಬ) ಮಹಿಳಾ ಮೀಸಲಾತಿ
 ಕ) ಸಮಾನತೆಗಾಗಿ ಚಳುವಳಿ
 ಡ) ಕನಸಿನ ಮದುವೆ
15. ಶ್ರೀ 'ಬಂದೇ ನವಾಜ್' ಯಾರು?
 ಅ) ಗುಲಬರ್ಗಾದ ಸೂಫಿ ಸಂತರು
 ಬ) ಬ್ರಿಟಿಶರಿಂದ ಉಂಬಳಿ ಪಡೆದವರು
 ಕ) ವಜ್ರ ವ್ಯಾಪಾರಿಗಳು
 ಡ) ಗಣಿ ಧಣಿ
16. 'ರೆಹಮಾನರ ಹಾಡಿನ ಕಂಪೋಷಿಸನ ಚೆನ್ನಾಗಿದೆ' ಎನ್ನುವ ವಾಕ್ಯದಲ್ಲಿ ಕಂಪೋಷಿಸನ ಪದಕ್ಕೆ ಸರಿಯಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ಧ್ವನಿ ಸಂಪತ್ತು
 ಬ) ಸಂಯೋಜನೆ
 ಕ) ನಿರ್ದೇಶನ
 ಡ) ಕಂಠದಾನ
17. 'ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು' ಲೇಖನದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಪ್ರವಾಸದ ಉದ್ದೇಶ :
 ಅ) ಆನೆ ದಂತ ಸಂಗ್ರಹಣೆ
 ಬ) ಖೆಡ್ಡಾಗಳ ಕುರಿತು ಅಧ್ಯಯನ
 ಕ) ಸಸ್ಯ ವೀಕ್ಷಣೆ
 ಡ) ಹುಲಿ ವೀಕ್ಷಣೆ
18. ಡಾ|| ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣನವರ 'ಗಾಂಧಿ' ಕಥೆ ಏನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ವರ್ಣಾಶ್ರಮ ಪದ್ಧತಿ
 ಬ) ಜಾತೀಯತೆ
 ಕ) ಮುಢ ನಂಬಿಕೆ
 ಡ) ಮಹಾತ್ಮ ಗಾಂಧೀಜಿಯವರ ಮೌಲ್ಯಗಳಿಗೆ ಒದಗಿರುವ ಅವಸ್ಥೆಯನ್ನು
19. ಶ್ರೀ ಶಿವರಾಮ ಕಾರಂತರ "ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ" ಲೇಖನ ಯಾವ ರೀತಿ ಯಾಗಿದೆ?
 ಅ) ವಿಡಂಬನೆ
 ಬ) ನಾಟಕ
 ಕ) ಪ್ರವಾಸ ಕಥನ
 ಡ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ
20. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ವ್ಯಕ್ತಿತ್ವಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳುವಂತದ್ದು :
 ಅ) ಶಿಸ್ತು
 ಬ) ಪಾಶ್ಚಾತ್ಯ ದಿರಿಸು
 ಕ) ಹೊಣೆಗಾರಿಕೆ
 ಡ) ಮೇಲಿನ ಎಲ್ಲವು
21. 'ಸುಖ' ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ :
 ಅ) ದುಃಖ
 ಬ) ನಲಿವು
 ಕ) ಸಂತೋಷ
 ಡ) ಒಲವು

22. 'ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?' ಲೇಖನ ಯಾವ ರೀತಿಯಲ್ಲಿದೆ?
 ಅ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ ಬ) ವಿನೋದ ಲೇಖನ
 ಕ) ಪತ್ರಿಕಾ ಅಂಕಣ ಡ) ನಾಟಕ
23. ಶ್ರೀ ಪಿ.ಲಂಕೇಶ 'ಗುಬ್ಬಚ್ಚಿಗೂಡು' ಲೇಖನದಲ್ಲಿ ಚಿಂತಿಸಿರುವುದು :
 ಅ) ಭಟ್ಟಂಗಿಗಳ ಬದುಕು ಬ) ದೀನತೆಯ ಬದುಕು
 ಕ) ಸ್ವಂತಿಕೆಯ ಬದುಕು ಡ) ಅಸಮಾನತೆಯ ಬದುಕು
24. 'ಜನ' ಯಾವ ಲಿಂಗ
 ಅ) ಸ್ತ್ರೀ ಲಿಂಗ ಬ) ಪುಲ್ಲಿಂಗ
 ಕ) ಅಲಿಂಗ ಡ) ನಪುಂಸಕಲಿಂಗ
25. 'ಅಂಬಿಕಾತನಯದತ್ತ' ಕಾವ್ಯನಾಮದ ಕವಿ :
 ಅ) ದ.ರಾ. ಬೇಂದ್ರೆ ಬ) ಕೆ.ವಿ.ಪುಟ್ಟಪ್ಪ
 ಕ) ವಿ.ಕೃ.ಗೋಕಾಕ ಡ) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
26. ಕನ್ನಡಕ್ಕೆ ಸಂದಿರುವ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿಗಳು :
 ಅ) ೧೦ ಬ) ೮
 ಕ) ೭ ಡ) ೯
27. 'ಶ್ರಾವಣ' ಕವನದಲ್ಲಿ ಕವಿ ಯಾವುದರ ಸೌಂದರ್ಯವನ್ನು ವರ್ಣಿಸಿದ್ದಾರೆ?
 ಅ) ಧಾರವಾಡದ ಬ) ಬೆಂಗಳೂರಿನ
 ಕ) ನಿಸರ್ಗದ ಡ) ಬೆಳಗಾವಿಯ
28. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಮೊದಲಬಾರಿ ಜೋಗ ಜಲಪಾತದ ಎದುರು ನಿಂತಾಗ ಹೇಳಿದ್ದು:
 ಅ) ಎಷ್ಟೊಂದು ಬೆಳೆ ಪೋಲಾಗುತ್ತಿದೆ
 ಬ) ಎಷ್ಟೊಂದು ಸಮಯ ಪೋಲಾಗುತ್ತಿದೆ
 ಕ) ಎಷ್ಟೊಂದು ಹಣ ಪೋಲಾಗುತ್ತಿದೆ
 ಡ) ಎಷ್ಟೊಂದು ಶಕ್ತಿ ಪೋಲಾಗುತ್ತಿದೆ
29. ಶ್ರೀ ಕುವೆಂಪುರವರ ಲೇಖನ ಯಾವ ಭಾಗದ ಚಿತ್ರಣವನ್ನು ನೀಡುತ್ತದೆ?
 ಅ) ಮಲೆನಾಡು ಬ) ಕರಾವಳಿ
 ಕ) ಮರುಭೂಮಿ ಡ) ದೊಡ್ಡನಗರ ಪ್ರದೇಶ
30. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಭಾಷಣಕ್ಕೆ ಯಾವುದು ಸರಿಹೊಂದುವುದಿಲ್ಲ?
 ಅ) ಆಲೋಚನೆಯಲ್ಲಿ ಸತ್ಯನಿಷ್ಠೆ.
 ಬ) ಹಾವಭಾವ-ಮಾತಿನ ಮಂಟಪದಲ್ಲಿ ಜನರನ್ನು ಮರಳುಮಾಡುವುದು.
 ಕ) ಭಾಷಣದ ಕುರಿತು ತಯಾರಿ
 ಡ) ಶೋತೃವರ್ಗಕ್ಕೆ ಗೌರವ

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

ಕನ್ನಡ ಮನಸು

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

ಸೂಚನೆಗಳು

1. ಎಲ್ಲ ೩೦ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರಿಸಿರಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.
2. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯು.ಎಸ್.ಎನ್ ಸಂಖ್ಯೆ ಹಾಗೂ ಪಶ್ಚಿಮ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ಅಂದರೆ A, B, C ಅಥವಾ D ಯನ್ನು ತಪ್ಪಿಲ್ಲದಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಗುರುತಿಸುವುದು ಅಭ್ಯರ್ಥಿಯ ಜವಾಬ್ದಾರಿಯಾಗಿರುತ್ತದೆ.
3. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವ ಸ್ಥಳದಲ್ಲಿ ಭರ್ತಿಮಾಡದೆ ಹಾಗೆಯೇ ಬಿಟ್ಟಲ್ಲಿ ಅಥವಾ ಭರ್ತಿಮಾಡಿದ ಮಾಹಿತಿಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಅಂತಹ ಉತ್ತರ ಪತ್ರಿಕೆಗಳನ್ನು ರದ್ದು ಪಡಿಸಲಾಗುವುದು.
4. ಕೇವಲ ಒಂದು ಉತ್ತರವನ್ನು ಮಾತ್ರ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಗುರುತಿಸತಕ್ಕದ್ದು. ಒಂದೆ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಉತ್ತರವನ್ನು ಗುರುತಿಸುವುದು ಅಮಾನ್ಯ.
5. ಎಲ್ಲಾ ಉತ್ತರಗಳನ್ನು ನಿಮಗೆ ಒದಗಿಸಲಾದ ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯ ಹಾಳೆಯ ಮೇಲೆ ಕಪ್ಪು ಅಥವಾ ನೀಲಿ ಶಾಹಿಯ ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಗುರುತು ಮಾಡಬೇಕು.

1. ಶ್ರೀ ಸಿದ್ಧಲಿಂಗಯ್ಯನವರ 'ಬೆಳ್ಳಿಯ ಕಾಡು' ಕವನದಲ್ಲಿ ಕಂಡುಬರುವ ಅಂಶ :
ಅ) ಸಮಾಜದ ಸುಸ್ಥಿತಿ ಬ) ಪ್ರೇಮದ ರಮ್ಯತೆ
ಕ) ಭಕ್ತಿಯ ಪರವಶತೆ ಡ) ದಲಿತರ ಕನಸು
2. 'ಒಲೆಹತ್ತಿ ಉರಿದಡೆ ನಿಲಬಹುದಲ್ಲದೇ, ಧರೆಹತ್ತಿ ಉರಿದರೆ ನಿಲಬಾರದು, ಏರಿ ನೀರುಂಬಡೆ ಬೇಲಿ ಹೊಲದ ಮೇವೊಡೆ, ನಾರಿ ತನ್ನ ಮನೆಯಲ್ಲಿ ಕಳುವೊಡೆ, ತಾಯಿಯ ಮೊಲೆಹಾಲು ನಂಜಾಗಿ ಕೊಲವುಡೆ ಇನ್ನಾರಿಗೆ ದೂರುವೆ ಕೂಡಲ ಸಂಗಮದೇವಾ' ಈ ವಚನದ ರಚನೆಕಾರರು:
ಅ) ಸರ್ವಜ್ಞ ಬ) ಚಾಮರಸ
ಕ) ಅಲ್ಲಮಪ್ರಭು ಡ) ಬಸವಣ್ಣ
3. ಮಲೆಮಾದೇಶ್ವರ ಬೆಟ್ಟವಿರುವ ಸ್ಥಳ:
ಅ) ಅರಿಶಿನಕುಂಟೆ ಬ) ಅಥಣಿ
ಕ) ಅಘಜಲಪುರ ಡ) ಕೊಳ್ಳೆಗಾಲ

4. 'ಶ್ರೀ ಸಂಗೊಳ್ಳಿ ರಾಯಣ್ಣ' ಯಾರು?
 ಅ) ಅದ್ಭುತ ಭಾಷಣಕಾರ ಬ) ವಂದಿಮಾಗಧರಿಗೆ ಸೇರಿದವನು
 ಕ) ಬ್ಯಾಂಕಗಳಿಗೆ ಮೋಸ ಮಾಡಿದವನು ಡ) ಬ್ರಿಟಿಷರ ವಿರುದ್ಧ ಹೋರಾಡಿದ ಹೋರಾಟಗಾರ
5. ಮೊದಲು ಕನ್ನಡಕ್ಕೊಂದು ಅಪರೂಪ ನಿಘಂಟನ್ನು ರಚಿಸಿಕೊಟ್ಟವರು:
 ಅ) ಪಂಪ ಬ) ಹರಿಹರ
 ಕ) ಮೆಕಾಲೆ ಡ) ಕಿಟ್ಟೆಲ್
6. 'ಕನ್ನಡ ಸಂಸ್ಕೃತಿ' ಈ ರೀತಿಯಾಗಿದೆ :
 ಅ) ಬಹುರೂಪಿಯಾಗಿದೆ ಬ) ವರ್ಣರಂಜಿತವಾಗಿದೆ
 ಕ) ಜೀವಂತವಾಗಿದೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
7. ಪತ್ರ ವ್ಯವಹಾರ - ಮನವಿಗಳಲ್ಲಿ ಇರಬೇಕಾದದ್ದು :
 ಅ) ಸ್ಪಷ್ಟ ಮಾಹಿತಿ ಬ) ನೇರ ನಿರೂಪಣೆ
 ಕ) ಸೌಜನ್ಯ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
8. ಸಚಿವ + ಆಲಯ = ಸಚಿವಾಲಯ, ಇಲ್ಲಿರುವ ಸಂಧಿ :
 ಅ) ಸುವರ್ಣ ಸಂಧಿ ಬ) ಸರ್ವರ್ಣ ಧೀರ್ಘ ಸಂಧಿ
 ಕ) ರಾಜಯೋಗ ಸಂಧಿ ಡ) ವೃದ್ಧಿ ಸಂಧಿ
9. 'ವಿಶ್ವ ಮಾನವತೆ' ಎನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ಕಂದಾಚಾರ ಬ) ಮೂಢನಂಬಿಕೆ
 ಕ) ಸಾಮರಸ್ಯ-ಸಹಿಷ್ಣುತೆ ಡ) ಮತೀಯ ದ್ವೇಷ
10. 'ಪಡುವಣ' ಪದದ ವಿರುದ್ಧಾರ್ಥಕ ಪದ
 ಅ) ಕೊಂಕಣ ಬ) ಬಡಗಣ
 ಕ) ತೆಂಕಣ ಡ) ಮೂಡಣ
11. 'ನಾನು ನಿನ್ನೆ ಕೆ.ಜಿ.ಎಫ್‌ಗೆ ಹೋಗಿದ್ದೆನು' ಈ ವಾಕ್ಯದಲ್ಲಿರುವ ಕಾಲ :
 ಅ) ಭೂತ ಕಾಲ ಬ) ರಾಜಯೋಗ ಕಾಲ
 ಕ) ಯಮಗಂಡ ಕಾಲ ಡ) ರಾಹು ಕಾಲ
12. 'ಫೋಟೋಗ್ರಾಫಿ' ಪದಕ್ಕೆ ಸಮನಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ವರ್ಣ ಚಿತ್ರ ಬ) ಛಾಯಾ ಚಿತ್ರ
 ಕ) ತೈಲ ಚಿತ್ರ ಡ) ಚಲನ ಚಿತ್ರ
13. 'ಬೆಣ್ಣೆ ಹಚ್ಚು' ಪದದ ಸರಿಯಾದ ಅರ್ಥ:
 ಅ) ರೊಟ್ಟಿಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು ಬ) ದೋಸೆಗೆ ಬೆಣ್ಣೆ ಹಚ್ಚು
 ಕ) ಹೊಗಳುವುದು ಡ) ರಾಗಿಮುದ್ದೆಗೆ ಬೆಣ್ಣೆ

14. 'ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು' ಕವನ ಯಾವುದರ ಕುರಿತಾಗಿದೆ?
 ಅ) ಸಂಪ್ರದಾಯಗಳಿಗಿಂತಲು ಮಿಗಿಲಾಗಿರುವುದು ಮಹಿಳೆಯ ಘನತೆ.
 ಬ) ಮಹಿಳಾ ಮೀಸಲಾತಿ
 ಕ) ಸಮಾನತೆಗಾಗಿ ಚಳುವಳಿ
 ಡ) ಕನಸಿನ ಮದುವೆ
15. ಶ್ರೀ 'ಬಂದೇ ನವಾಜ್' ಯಾರು?
 ಅ) ಗುಲಬರ್ಗಾದ ಸೂಫಿ ಸಂತರು ಬ) ಬ್ರಿಟಿಶರಿಂದ ಉಂಬಳಿ ಪಡೆದವರು
 ಕ) ವಜ್ರ ವ್ಯಾಪಾರಿಗಳು ಡ) ಗಣಿ ಧಣಿ
16. 'ರೆಹಮಾನರ ಹಾಡಿನ ಕಂಪೋಷನ ಚೆನ್ನಾಗಿದೆ' ಎನ್ನುವ ವಾಕ್ಯದಲ್ಲಿ ಕಂಪೋಷನ ಪದಕ್ಕೆ ಸರಿಯಾದ ಕನ್ನಡದ ಪದ:
 ಅ) ಧ್ವನಿ ಸಂಪತ್ತು ಬ) ಸಂಯೋಜನೆ
 ಕ) ನಿರ್ದೇಶನ ಡ) ಕಂಠದಾನ
17. 'ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು' ಲೇಖನದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಪ್ರವಾಸದ ಉದ್ದೇಶ :
 ಅ) ಆನೆ ದಂತ ಸಂಗ್ರಹಣೆ ಬ) ಖೆಡ್ಡಾಗಳ ಕುರಿತು ಅಧ್ಯಯನ
 ಕ) ಸಸ್ಯ ವೀಕ್ಷಣೆ ಡ) ಹುಲಿ ವೀಕ್ಷಣೆ
18. ಡಾ|| ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣನವರ 'ಗಾಂಧಿ' ಕಥೆ ಏನನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ?
 ಅ) ವರ್ಣಾಶ್ರಮ ಪದ್ಧತಿ
 ಬ) ಜಾತೀಯತೆ
 ಕ) ಮುಢ ನಂಬಿಕೆ
 ಡ) ಮಹಾತ್ಮ ಗಾಂಧೀಜಿಯವರ ಮೌಲ್ಯಗಳಿಗೆ ಒದಗಿರುವ ಅವಸ್ಥೆಯನ್ನು
19. ಶ್ರೀ ಶಿವರಾಮ ಕಾರಂತರ "ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ" ಲೇಖನ ಯಾವ ರೀತಿ ಯಾಗಿದೆ?
 ಅ) ವಿಡಂಬನೆ ಬ) ನಾಟಕ
 ಕ) ಪ್ರವಾಸ ಕಥನ ಡ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ
20. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ವ್ಯಕ್ತಿತ್ವಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳುವಂತದ್ದು :
 ಅ) ಶಿಸ್ತು ಬ) ಪಾಶ್ಚಾತ್ಯ ದಿರಿಸು
 ಕ) ಹೊಣೆಗಾರಿಕೆ ಡ) ಮೇಲಿನ ಎಲ್ಲವು
21. 'ಸುಖ' ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ :
 ಅ) ದುಃಖ ಬ) ನಲಿವು
 ಕ) ಸಂತೋಷ ಡ) ಒಲವು

22. 'ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?' ಲೇಖನ ಯಾವ ರೀತಿಯಲ್ಲಿದೆ?
 ಅ) ತಂತ್ರಜ್ಞಾನ ಲೇಖನ ಬ) ವಿನೋದ ಲೇಖನ
 ಕ) ಪತ್ರಿಕಾ ಅಂಕಣ ಡ) ನಾಟಕ
23. ಶ್ರೀ ಪಿ.ಲಂಕೇಶ 'ಗುಬ್ಬಚ್ಚಿಗೂಡು' ಲೇಖನದಲ್ಲಿ ಚಿಂತಿಸಿರುವುದು :
 ಅ) ಭಟ್ಟಂಗಿಗಳ ಬದುಕು ಬ) ದೀನತೆಯ ಬದುಕು
 ಕ) ಸ್ವಂತಿಕೆಯ ಬದುಕು ಡ) ಅಸಮಾನತೆಯ ಬದುಕು
24. 'ಜನ' ಯಾವ ಲಿಂಗ
 ಅ) ಸ್ತ್ರೀ ಲಿಂಗ ಬ) ಪುಲ್ಲಿಂಗ
 ಕ) ಅಲಿಂಗ ಡ) ನಪುಂಸಕಲಿಂಗ
25. 'ಅಂಬಿಕಾತನಯದತ್ತ' ಕಾವ್ಯನಾಮದ ಕವಿ :
 ಅ) ದ.ರಾ. ಬೇಂದ್ರೆ ಬ) ಕೆ.ವಿ.ಪುಟ್ಟಪ್ಪ
 ಕ) ವಿ.ಕೃ.ಗೋಕಾಕ ಡ) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
26. ಕನ್ನಡಕ್ಕೆ ಸಂದಿರುವ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿಗಳು :
 ಅ) ೧೦ ಬ) ೮
 ಕ) ೭ ಡ) ೯
27. 'ಶ್ರಾವಣ' ಕವನದಲ್ಲಿ ಕವಿ ಯಾವುದರ ಸೌಂದರ್ಯವನ್ನು ವರ್ಣಿಸಿದ್ದಾರೆ?
 ಅ) ಧಾರವಾಡದ ಬ) ಬೆಂಗಳೂರಿನ
 ಕ) ನಿಸರ್ಗದ ಡ) ಬೆಳಗಾವಿಯ
28. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಮೊದಲಬಾರಿ ಜೋಗ ಜಲಪಾತದ ಎದುರು ನಿಂತಾಗ ಹೇಳಿದ್ದು:
 ಅ) ಎಷ್ಟೊಂದು ಬೆಳೆ ಪೋಲಾಗುತ್ತಿದೆ
 ಬ) ಎಷ್ಟೊಂದು ಸಮಯ ಪೋಲಾಗುತ್ತಿದೆ
 ಕ) ಎಷ್ಟೊಂದು ಹಣ ಪೋಲಾಗುತ್ತಿದೆ
 ಡ) ಎಷ್ಟೊಂದು ಶಕ್ತಿ ಪೋಲಾಗುತ್ತಿದೆ
29. ಶ್ರೀ ಕುವೆಂಪುರವರ ಲೇಖನ ಯಾವ ಭಾಗದ ಚಿತ್ರಣವನ್ನು ನೀಡುತ್ತದೆ?
 ಅ) ಮಲೆನಾಡು ಬ) ಕರಾವಳಿ
 ಕ) ಮರುಭೂಮಿ ಡ) ದೊಡ್ಡನಗರ ಪ್ರದೇಶ
30. ಶ್ರೀ ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಭಾಷಣಕ್ಕೆ ಯಾವುದು ಸರಿಹೊಂದುವುದಿಲ್ಲ?
 ಅ) ಆಲೋಚನೆಯಲ್ಲಿ ಸತ್ಯನಿಷ್ಠೆ.
 ಬ) ಹಾವಭಾವ-ಮಾತಿನ ಮಂಟಪದಲ್ಲಿ ಜನರನ್ನು ಮರಳುಮಾಡುವುದು.
 ಕ) ಭಾಷಣದ ಕುರಿತು ತಯಾರಿ
 ಡ) ಶೋತೃವರ್ಗಕ್ಕೆ ಗೌರವ

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Question Paper Version : B

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

**Constitution of India, Professional Ethics
and Human Rights (CPH)**

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

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Question Paper Version : B

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(COMMON TO ALL BRANCHES)

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 - b) 15
 - c) 18
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27. The total number of elected members from various states in Lok Sabha are
- a) 530
 - b) 540
 - c) 550
 - d) 500
28. This is not the jurisdiction of the Supreme Court.
- a) Original Jurisdiction
 - b) Emergency Jurisdiction
 - c) Appellate Jurisdiction
 - d) Advisory Jurisdiction.
29. Collective responsibility of the State Council of Ministers means, all Ministers are collectively responsible to the
- a) Chief Minister
 - b) Governor
 - c) State Legislative Council
 - d) State Legislative Assembly.
30. The Governor may resign his office by writing to
- a) The Prime Minister
 - b) The President
 - c) The Chief Justice of High Court
 - d) The Chief Minister of the State

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Question Paper Version : B

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

**Constitution of India, Professional Ethics
and Human Rights (CPH)**

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the thirty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
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-
1. The Election Commission of India does not conduct election to
 - a) The Parliament
 - b) The office of the President
 - c) The post of Prime Minister
 - d) The office of the Vice President
 2. What is the tenure of the Chief Election Commissioner and other election commissioners?
 - a) 3 years or upto 62 years of age
 - b) 5 years or upto 65 years of age
 - c) 6 years or upto 65 years of age
 - d) 5 years or upto 70 years of age
 3. The procedure for amending the Indian Constitution is detailed under
 - a) Art. 356
 - b) Art. 360
 - c) Art. 366
 - d) Art. 368
 4. Art. 21A – Right to Education as a Fundamental Right was added to the Indian constitution by
 - a) 61st Constitution Amendment
 - b) 74th Constitution Amendment
 - c) 86th Constitution Amendment
 - d) 91st Constitution Amendment
 5. When the State Emergency is in operation, the President cannot interfere in the matters of
 - a) State Judiciary
 - b) State Executive
 - c) State Legislature
 - d) All of these.

6. While Proclamation of National Emergency is in operation, the President cannot suspend certain Fundamental Rights. These are
- a) Art. 14 and Art. 15
 - b) Art. 14 and Art. 16
 - c) Art. 20 and Art. 21
 - d) Art. 32
7. B. P. Mandal commission appointed in 1978 by the President of India dealt with
- a) Rights of the minority
 - b) Laws relating to child labour
 - c) Laws relating to sexual harassment at work places
 - d) Reservation for other backward classes (OBC) people in Government Jobs.
8. Who are considered to be vulnerable group?
- a) Women and children
 - b) Scheduled Caste people
 - c) Scheduled Tribe people
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9. Who can be appointed as the Chairman of the National Human Rights Commission?
- a) Any sitting judge of the Supreme Court
 - b) Any retired Chief Justice of the Supreme Court
 - c) Any person appointed by the President
 - d) Retired Chief Justice of any High Court
10. National Human Rights commission is a _____
- a) Statutory body
 - b) Constitutional body
 - c) Multilateral Institution
 - d) Both (a) and (c)
11. Powers, authority and responsibilities of Municipalities have been provided under
- a) Article 243 N
 - b) Article 243 W
 - c) Article 243 M
 - d) None of these
12. Which among the following is considered as the training ground for the development of democratic institutions?
- a) Nagar Panchayats
 - b) Municipalities
 - c) Municipal Corporations
 - d) Gram Panchayats
13. Good works mean
- a) Superior work done with great care and skill
 - b) Responsible work
 - c) Work above and beyond the call of duty
 - d) Work involving high risk.
14. Engineering profession is considered to be like a building, its foundation is
- a) Hard and sincere work
 - b) Expert engineering knowledge and skill
 - c) Sound common sense and expert knowledge
 - d) Honesty
15. In engineering research work, cooking means
- a) Boiling under pressure
 - b) Retaining only those results which fit the theory
 - c) Making deceptive statements
 - d) Misleading the public about the quality of the product

16. Engineering Ethics is a
a) Preventive ethics
b) Natural ethics
c) Technical ethics
d) Scientifically developed ethics
17. The author of a book retains the copy right for _____ after his or her death.
a) 20 years
b) 30 years
c) 60 years
d) 10 years
18. The public is put to increased risk by allowing increased number of deviations from specified standards of safety and acceptable risk is known as
a) Normal accident
b) Normalizing deviance
c) Risk assessment
d) Overestimated risk.
19. The constitution of India derives its authority from the
a) Parliament of India
b) Supreme Court of India
c) People of India
d) Constituent Assembly of India
20. It is not the objective enshrined in the preamble
a) Equality of status
b) Secure shelter and proper livelihood to all
c) Liberty of thought and expression
d) Social, economic and political justice
21. Right of decent environment includes
a) Freedom to reside in any part of India.
b) Right to religion
c) Right to equal protection of law.
d) Right to life.
22. The Emergency provisions incorporated in the Constitution of India were influenced by the Constitution of
a) German Reich
b) U.S.A
c) Russia
d) Canada
23. The Directive Principles of State Policy directs the State to secure to all workers
a) Minimum wages
b) Fair wages
c) Living wages
d) Standard wages
24. This is not a fundamental duty.
a) To defend the country
b) To abjure violence
c) To uphold and protect sovereignty of India
d) To make scientific improvement
25. The ground for the impeachment of President is
a) Failure to follow the advice given by the Prime Minister
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d) Misbehaviour with foreign dignitaries.
26. The size of the Union council of ministers including Prime Minister shall not be more than _____ percent of the members strength of Lok Sabha.
a) 10
b) 15
c) 18
d) 20

27. The total number of elected members from various states in Lok Sabha are
- | | |
|--------|--------|
| a) 530 | b) 540 |
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| a) Chief Minister | b) Governor |
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Question Paper Version : B

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

**Constitution of India, Professional Ethics
and Human Rights (CPH)**

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 30

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Analog and Digital Electronics

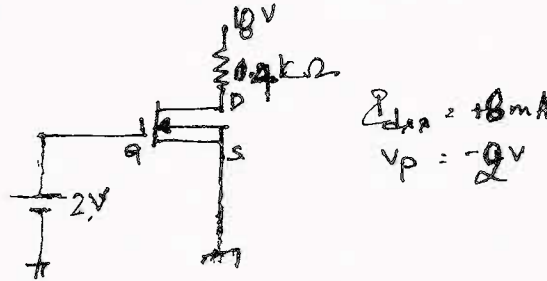
Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain construction and working principle of operations of n-channel D-MOSFET along with its drain and trans-conductance characteristics. (10 Marks)
- b. Write the difference between JEFT's and MOSFET's. (05 Marks)
- c. For a given self-bias configuration in Fig.Q.1(c), determine: i) I_{DQ} and $V_{g'seq}$ ii) V_{ds} and V_D . (05 Marks)



OR

- 2 a. List of differences between ideal and practical op-amp amplifier. (06 Marks)
- b. With a neat diagram and waveform explain astable multivibrator using 555 timers. (07 Marks)
- c. With neat diagram and waveform explain the working of relaxation oscillation oscillator. (07 Marks)

Module-2

- 3 a. Explain positive and negative logic. List the equivalence between them. (08 Marks)
- b. Find the minimal SOP form for the given min-terms using K-map.
 $F(A, B, C, D) = \sum m(4, 5, 6) + d(10, 12, 13, 14, 15)$. (06 Marks)
- c. Find the minimal POS form for the given MAX-TERM using K-map.
 $f(a, b, c, d) = \pi M(5, 7, 8, 9, 12) + d(0, 6, 10, 15)$. (06 Marks)

OR

- 4 a. Using Quine-Mc-Clusky method simplify the following Boolean equation.
 $f(a, b, c, d) = \sum m(0, 1, 10, 11, 13, 15) + d(2, 3, 12, 14)$. (10 Marks)
- b. Define Hazard. Explain different types of Hazards. (06 Marks)
- c. Write the VHDL code for the circuit shown in Fig.Q.4(c): (04 Marks)

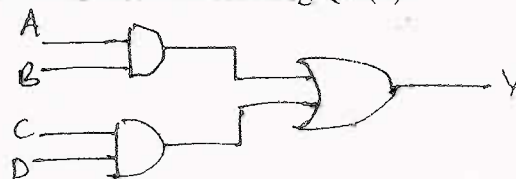


Fig.Q.4(c)
1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-3

- 5 a. What is multiplexers? Design 8:1 multiplexer using 2:1 multiplexers. (08 Marks)
 b. Explain the purpose of using parity generators and checkers using suitable illustrations. (06 Marks)
 c. What is magnitude comparator? Explain 1 bit magnitude comparator. (06 Marks)

OR

- 6 a. Design 7-segment decoder using PLA. (06 Marks)
 b. With neat logic diagram and truth table, explain negative edge triggered J-K flip-flop. (06 Marks)
 c. What is an Adder? Explain with truth table the half Adder, full Adder, half subtractor and full subtractor. (08 Marks)

Module-4

- 7 a. With a neat logic diagram and truth table explain the working of J-K master slave flip-flop using NAND gates. (08 Marks)
 b. Give characteristic table, characteristic equation and excitation table for S-R, D and J-K flip-flop. (08 Marks)
 c. Write a VHDL code for D-flip-flop. (04 Marks)

OR

- 8 a. What is a register? With neat diagram explain 4-bit parallel-in-serial out shift register. (08 Marks)
 b. Explain with a neat diagram how a shift register can be applied for serial-addition. (06 Marks)
 c. Differentiate between synchronous and asynchronous counters. (06 Marks)

Module-5

- 9 a. Define counter. Design a synchronous counter for the sequence, $0 \rightarrow 3 \rightarrow 1 \rightarrow 2 \rightarrow 6 \rightarrow 7 \rightarrow 0 \rightarrow 3$ using J-K flip flop. (12 Marks)
 b. Explain with neat diagram the working principle of Digital Clock. (08 Marks)

OR

- 10 a. Explain the binary ladder with digital input of 1000. (06 Marks)
 b. Explain 2-bit simultaneous A/D converter. (08 Marks)
 c. Explain the terms accuracy and resolution for D/A converters. (06 Marks)

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17CS33

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Data Structure and Applications

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define data structure. List and explain data structure operations. (05 Marks)
- b. Write the bubble sort algorithm. (05 Marks)
- c. List and explain in detail, three types of structures used to store the strings. (10 Marks)

OR

- 2 a. Explain dynamic memory allocation. (05 Marks)
- b. Explain about the representation of two dimensional arrays in memory. (05 Marks)
- c. What do you mean by pattern matching? Let P and T be strings with lengths R and S respectively and are stored as arrays with one character per element. Write a pattern matching algorithm that finds index P in T. Also discuss about this algorithm. (10 Marks)

Module-2

- 3 a. Define stack. Write the procedure for two basic operations associated with stack. (05 Marks)
- b. Write a short note on priority queues. (05 Marks)
- c. Define recursion. What are the properties of recursive procedure? Write recursive procedure for : i) Tower of Hanoi ii) Factorial of a number. (10 Marks)

OR

- 4 a. Define queues. Write QINSERT and QDELETE procedures for queues using arrays. (10 Marks)
- b. Write the postfix form of the following expression.
 $A + (B * C - D/E \uparrow F) * G) * H.$ (05 Marks)
- c. Write a note on Ackermann function. (05 Marks)

Module-3

- 5 a. Write the following algorithm for singly linked list.
 - i) Inserting ITEM as the first node in the list
 - ii) Deleting the node with the given ITEM of information. (10 Marks)
- b. Write the node structure for linked representation of polynomial. Write the function to add two polynomials represented using linked list. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Write the functions to perform the following :
- Inverting a singly linked list
 - Concatenating the singly linked list
 - Finding the length of a circular list. (10 Marks)
- b. Write a note on header linked list. (05 Marks)
- c. For the given sparse matrix, write the diagrammatic linked list representation.
- $$\begin{bmatrix} 2 & 0 & 0 & 0 \\ 4 & 0 & 0 & 3 \\ 0 & 0 & 0 & 0 \\ 8 & 0 & 0 & 1 \\ 0 & 0 & 6 & 0 \end{bmatrix}$$
- (05 Marks)

Module-4

- 7 a. What is a tree? write the routines to traverse the given string using
- Pre-order traversal
 - In-order traversal
 - Post-order traversal. (10 Marks)
- b. Define binary search tree. Write the recursive search and iterative search algorithm for a binary search tree. (10 Marks)

OR

- 8 a. Write the routines for :
- Copying binary trees
 - Testing for equality of binary trees. (10 Marks)
- b. List the rules to construct the threads. Write the routines for inorder traversal of a threaded binary tree. (10 Marks)

Module-5

- 9 a. Write an algorithm for an insertion sort. Also discuss about the complexity of insertion sort. (10 Marks)
- b. Write an algorithm for : i) Breadth first search ii) depth first search. (10 Marks)

OR

- 10 a. Define graph. Explain in detail about directed graphs. (10 Marks)
- b. Explain in detail about static and dynamic hashing. (10 Marks)

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17CS34

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Computer Organization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain with a neat diagram the connection between the processor and the computer memory. (05 Marks)
- b. Explain the Basic Instruction types with example. (05 Marks)
- c. Define Addressing mode, explain the various addressing modes with example. (10 Marks)

OR

- 2 a. Write an assembly program that reads a line of characters and display it. (05 Marks)
- b. What are assembler directives? Point out and explain the various directives with example. (05 Marks)
- c. Point out various shifts and rotate instruction and example with a neat diagram and example. (10 Marks)

Module-2

- 3 a. Define interrupt. Point out and explain the various ways of enabling and disabling interrupts. (07 Marks)
- b. What are Exceptions? Point out and explain the different kinds of exceptions. (05 Marks)
- c. What is interrupt nesting, explain with a neat diagram the implementation of interrupt priority, using individual interrupt request and acknowledge lines. (08 Marks)

OR

- 4 a. What is Bus Arbitration? Explain centralized and distributed arbitration. With a neat diagram. (10 Marks)
- b. Explain Universal serial Bus tree structure and split bus operation with a neat diagram. (10 Marks)

Module-3

- 5 a. Explain synchronous DRAMS with a block diagram. (05 Marks)
- b. Define ROM ; point out and explain various types of ROMS. (05 Marks)
- c. Define cache memory, explain various types of it with a neat block diagram. (10 Marks)

OR

- 6 a. What is Virtual memory? Explain virtual memory organization. (07 Marks)
- b. Explain the optical disk organization with a neat diagram. (10 Marks)
- c. Define Hit rate and miss penalty. (03 Marks)

Module-4

- 7 a. Draw 4-bit carry-look ahead adder and explain. (10 Marks)
- b. Perform multiplication for -13 and + 9 using Booth's Algorithm and explain Booth's Algorithm process. (10 Marks)

OR

- 8 a. Explain with a neat figure the circuit arrangement for binary division. (10 Marks)
b. Explain IEEE standard for floating point number. (10 Marks)

Module-5

- 9 a. Explain three – bus organization of the datapath with a neat block diagrams. (06 Marks)
b. Explain Hard Wired Control Unit Organization in a processing unit. (06 Marks)
c. Write the control sequence for execution of the Instruction. Add (R_3), R_1 in the execution of a complete instruction. (08 Marks)

OR

- 10 a. Explain briefly the block diagram of a digital camera. (10 Marks)
b. With a neat block diagram, explain the working of microwave oven in an embedded system. (10 Marks)

CBCS SCHEME

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17CS35

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Unix and Shell Programming

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. By writing a neat diagram, explain the architecture of UNIX. (10 Marks)
b. Discuss the following commands
i) ls ii) who iii) cat iv) echo (10 Marks)

OR

- 2 a. Explain the features of UNIX. (10 Marks)
b. Explain the commands used to add, modify and delete users. (10 Marks)

Module-2

- 3 a. What is a file? Explain different categories of files. (10 Marks)
b. By giving example, explain the following commands.
i) pwd ii) cd iii) mkdir iv) rmdir. (10 Marks)

OR

- 4 a. Discuss ls commands with options. (10 Marks)
b. Explain absolute method of changing permissions by giving example. (10 Marks)

Module-3

- 5 a. Explain different modes of Vi editor (10 Marks)
b. Discuss ex-mode commands of Vi editor. (10 Marks)

OR

- 6 a. Explain shell interpretive cycle. (04 Marks)
b. Which are standard files used in UNIX? Explain. (08 Marks)
c. By giving examples, explain extended regular expression. (08 Marks)

Module-4

- 7 a. With example, explain logical operators in shell programming. (05 Marks)
b. Discuss for statement in shell script with example. (05 Marks)
c. Write a shell program to do the following :
i) List of files ii) Processes of user iii) Today's date vi) Users of the system.
Using case conditional. (10 Marks)

OR

- 8 a. Discuss head and tail commands along with its options. (10 Marks)
b. By specifying examples, explain hard and soft links. (10 Marks)

Module-5

- 9 a. Along with the options and examples, explain ps command. (10 Marks)
b. By giving example, explain nice and nohup commands. (10 Marks)

OR

- 10 a. Explain string handling function of perl. (06 Marks)
b. With example, explain split and join function of perl. (06 Marks)
c. What is subroutine? Explain by giving example. (08 Marks)

* * * * *

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17CS36

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define proposition, tautology, contradiction. Determine whether the following compound statement is a tautology or not.
 $\{(p \vee q) \rightarrow r\} \leftrightarrow \{\neg r \rightarrow \neg(p \vee q)\}$ (06 Marks)
- b. Using the laws of logic, show that $(p \rightarrow q) \wedge [\neg q \wedge (r \vee \neg q)] \leftrightarrow \neg(q \vee p)$ (07 Marks)
- c. Establish the validity of the following argument
- $$\begin{array}{l} \forall x, p(x) \vee q(x) \\ \exists x, \neg p(x) \\ \forall x, \neg q(x) \vee r(x) \\ \forall x, s(x) \rightarrow \neg r(x) \\ \hline \therefore \exists x, \neg s(x) \end{array}$$
- (07 Marks)

OR

- 2 a. Define converge, inverse and contra positive of a conditional. Find converse, inverse and contra positive of $\forall x, (x > 3) \rightarrow (x^2 > 9)$, where universal set is R. (06 Marks)
- b. Test the validity of the following arguments:
- i) If there is a strike by students, the exam will
be postponed but the exam was not postponed.
 \therefore there was no strike by students.
- ii) If Ravi studies, then he will pass in DMS.
 If Ravi doesn't play cricket, then he will study.
Ravi failed in DMS.
 \therefore Ravi played cricket (06 Marks)
- c. Define dual of logical statement. Write the dual of the statement
 $(p \vee T_0) \wedge (q \vee F_0) \vee (r \wedge s \wedge T_0)$. (02 Marks)
- d. Let $p(x) : x \geq 0$
 $q(x) : x^2 \geq 0$ and $r(x) : x^2 - 3x - 4 = 0$
 Then, for the universe completing of all real numbers, find the truth values of :
- i) $\exists x \{p(x) \wedge q(x)\}$ ii) $\forall x \{p(x) \rightarrow q(x)\}$ iii) $\exists x \{p(x) \wedge r(x)\}$ (06 Marks)

Module-2

- 3 a. Prove that for any positive integer n, $\sum_{i=1}^n \frac{F_{i-1}}{2^i} = 1 - \frac{F_{n+2}}{2^n}$, F_n denote the Fibonacci number. (06 Marks)
- b. How many positive integers n can we form using the digits 3, 4, 4, 5, 5, 6, 7 if we want n to exceed 5,000,000? (07 Marks)
- c. Determine the coefficient of $a^2 b^3 c^2 d^5$ in the expansion of $(a + 2b - 3c + 2d + 5)^{16}$. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 4 a. Prove by using principle of mathematical induction

$$\sum_{i=1}^n i \cdot 2^i = 2 + (n-1) \cdot 2^{n+1}$$

(06 Marks)

- b. A committee of 12 is to be selected from 10 men and 10 women. In how many ways can the selection be carried out if
- There are no restrictions
 - There must be six men and six women
 - There must be an even number of women.
- (07 Marks)
- c. Determine the number of integer solutions of $x_1 + x_2 + x_3 + x_4 = 32$ where $x_i \geq 0, 1 \leq i \leq 4$.
(07 Marks)

Module-3

- 5 a. If $A = \{1, 2, 3, 4, 5\}$ and there are 6720 injective functions $f: A \rightarrow B$, what is $|B|$? (03 Marks)
- b. Let m, n be positive integers with $1 < n \leq m$ then prove that,
 $s(m+1, n) = s(m, n-1) + ns(m, n)$ (05 Marks)
- c. If $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^2$, determine whether the function is one-to-one and whether it is onto. If it is not onto, find the range. (06 Marks)
- d. Let $A = \{1, 2, 3, 4, 5\} \times \{1, 2, 3, 4, 5\}$ and define R on A by $(x_1, y_1) R (x_2, y_2)$ if $x_1 + y_1 = x_2 + y_2$, verify that R is an equivalence relation on A . (06 Marks)

OR

- 6 a. If $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^3$, determine whether f is invertible and if determine f^{-1} . (05 Marks)
- b. Define the relation R for two lines ℓ_1 and ℓ_2 by $\ell_1 R \ell_2$ if ℓ_1 is perpendicular to ℓ_2 . Determine whether the relation is reflexive, symmetric, antisymmetric or transitive. (05 Marks)
- c. Let $A = \{1, 2, 3, 6, 9, 18\}$ and R on A by xRy if $x|y$. Draw the Hasse diagram for the poset (A, R) . (05 Marks)
- d. For $A = \{1, 2, 3, 4\}$, let $R = \{(1, 1) (1, 2) (2, 3) (3, 3) (3, 4)\}$ be a relation on A . Draw the directed graph G on A that is associated with R . Do likewise for R^2, R^3 . (05 Marks)

Module-4

- 7 a. Determine the number of positive integers n where $1 \leq n \leq 100$ and n is not divisible by 2, 3 or 5. (06 Marks)
- b. How many derangements are there for 1, 2, 3, 4 and 5? (07 Marks)
- c. Solve the recurrence relation $2a_{n+3} = a_{n+2} + 2a_{n+1} - a_n, n \geq 0, a_0 = 0, a_1 = 1, a_2 = 2$. (07 Marks)

OR

- 8 a. In how many ways can the 26 letters of the alphabet be permuted so that none of the patterns car, dog, pun or byte occurs? (06 Marks)
- b. Find the root polynomial for 3×3 board using the expansion formula. (07 Marks)
- c. The number of bacteria in a culture is 1000 (approximately) and this number increases 250% every two hours. Use a recurrence relation to determine the number of bacteria present after one day. (07 Marks)

Module-5

- 9 a. Show that the graphs Fig. Q(a)(i) and (ii) are isomorphic.

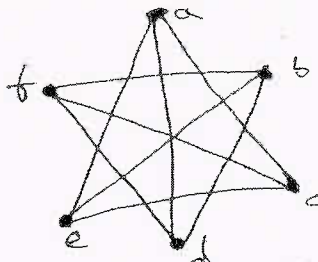


Fig. Q(a)(i)

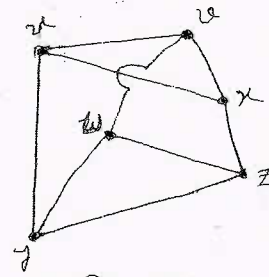


Fig. Q(a)(ii)

(06 Marks)

- b. Let $G = (V, E)$ be an undirected graph or multigraph with no isolated vertices. Then prove that G has an Euler circuit if and only if G is connected and every vertex in G has even degree. (07 Marks)
- c. Construct an optimal prefix code for the symbols $a, b, c, d, e, f, g, h, i, j$ that occur with respective frequencies 78, 16, 30, 35, 125, 31, 20, 50, 80, 3. (07 Marks)

OR

- 10 a. Let $G = (V, E)$ be a connected undirected graph. What is the largest possible value for $|V|$ if $|E| = 19$ and $\deg(v) \geq 4$ for all $v \in V$? (06 Marks)
- b. For every tree $T = (V, E)$ if $|V| \geq 2$, then prove that T has atleast two pendant vertices. (07 Marks)
- c. For the tree shown in Fig. Q10(c), list the vertices according to a preorder and a postorder traversal.

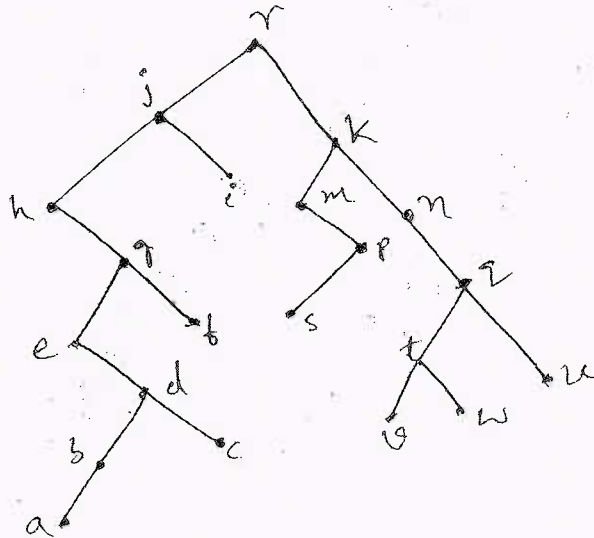


Fig. Q10(c)

(07 Marks)

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the working of N-channel MOSFET, with the help of neat diagram. (08 Marks)
 b. What are applications of FET? (04 Marks)
 c. What are the ideal characteristics of op-amp? (04 Marks)

OR

- 2 a. Explain the performance parameters of op-amp. (08 Marks)
 b. Explain the relaxation oscillator, with the help of neat diagram. (08 Marks)

Module-2

- 3 a. Minimize the following Boolean function using K-map method,
 $F(A, B, C, D) = \sum m(0, 2, 3, 8, 10, 11, 12, 14)$ (06 Marks)
 b. Apply Quine Mc-Cluskey method to find the essential prime implicants for the Boolean expression,
 $F(A, B, C, D) = \sum m(0, 1, 2, 3, 10, 11, 12, 13, 14, 15)$ (10 Marks)

OR

- 4 a. Minimize the following Boolean function using K-map method.
 $F(A, B, C, D) = \prod M(0, 1, 2, 3, 4) + \sum d(5, 7)$ (06 Marks)
 b. What is Hazard? Explain its types with examples. (10 Marks)

Module-3

- 5 a. Implement the following function using 8 : 1 multiplexer
 $F(A, B, C, D) = \sum m(1, 2, 5, 7, 8, 10, 11, 13, 14, 15)$ (06 Marks)
 b. Realize the following function using 3 : 8 decoder
 (i) $F(A, B, C) = \sum m(1, 3, 4)$
 (ii) $F(A, B, C) = \sum m(3, 5, 7)$ (04 Marks)
 c. Design a priority encoder using the truth table. The order of priority for three inputs is $X_1 > X_2 > X_3$ (06 Marks)

Truth Table

S	Input			Output	
	X ₁	X ₂	X ₃	A	B
0	X	X	X	0	0
1	1	X	X	0	1
1	0	1	X	1	0
1	0	0	1	1	1
1	0	0	0	0	0

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Design seven segment decoder using PLA. (08 Marks)
b. Design Half adder and Full adder. (08 Marks)

Module-4

- 7 a. Explain Smith contact bounce circuit. (08 Marks)
b. Give state transition diagram and characteristic equations for SR-FF and JK-FF. (08 Marks)

OR

- 8 a. With neat diagram, explain Ring and Johnson counter. (08 Marks)
b. What is shift register? With neat diagram, explain 4-bit parallel in serial out shift registers. (08 Marks)

Module-5

- 9 a. Define counter. Design mod-8 up synchronous counter using JK-FF. (12 Marks)
b. Write VHDL code for mod-8 up counter. (04 Marks)

OR

- 10 a. Explain the binary ladder with digital of 1000. (06 Marks)
b. Explain with neat diagram, single slope A/D converters. (10 Marks)

CBCS SCHEME

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15CS33

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write a C program with an appropriate structure definition and variable declaration to read and display information about an employee, using nested structures. Consider the following fields like Ename, Eid, DOJ(Date, Month, Year) and Salary (Basic, DA, HRA). (06 Marks)
- b. Consider 2 polynomials $A(x) = 2x^{1000} + 1$ and $B(x) = x^4 + 10x^3 + 3x^2 + 1$, show how these polynomials are stored in the 1-D array also give its C representation. (04 Marks)
- c. Write a C function to add 2 polynomials A and B store the result in polynomial C. (06 Marks)

OR

- 2 a. Consider the pattern ababab, construct the table and the corresponding labeled directed graph used in the second pattern matching algorithm. (06 Marks)
- b. Write transpose algorithm to transpose the given sparse matrix, express the given sparse

matrix as triplets and find its transpose (10 Marks)

$$\begin{bmatrix} 15 & 0 & 0 & 22 & 0 & -5 \\ 0 & 10 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & -4 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 91 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 28 & 0 & 0 & 0 \end{bmatrix}$$

Module-2

- 3 a. Implement push and POP functions for stack with stack full (using dynamic arrays) and stack empty conditions. (06 Marks)
- b. Define recursion, write a function for tower of hanoi. (06 Marks)
- c. Write a note on Dequques and Priority Queues. (04 Marks)

OR

- 4 a. Write a 'C' function to insert and delete an item into a circular queue. Explain how it is advantageous over linear Queue. (06 Marks)
- b. Convert the following infix expression to postfix form, (i) $a + (b + c) + (b/d) * a + z * u$
(ii) $A - B/C(C * D\$E)$ (04 Marks)
- c. Write a 'C' function to evaluate the postfix expression and trace the given postfix expression using stack $623 + -382 / + * 2\$3 +$ (06 Marks)

Module-3

- 5 a. Write 'C' function to perform the following:
 - (i) To insert a node at front end of the single linked list.
 - (ii) To delete a node at rear end of S.L.L.
 - (iii) To create an ordered S.L.L
 - (iv) To concatenate 2 S.L.L. (12 Marks)
- b. What are the advantages of double linked list over single linked list? Explain with an example. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

- 6 a. Write a C function to perform the following operations on double linked list:
 (i) Inserting a node at the beginning.
 (ii) Deleting a node at the rear end
 (iii) Inserting an item at a specified position. (09 Marks)
- b. Write a C function to add 2 polynomials represented as circular list with header nodes. (07 Marks)

Module-4

- 7 a. Define tree, for the tree given below define the following terminologies:
 (i) Degree
 (ii) Non Terminals and terminals nodes.
 (iii) Siblings
 (iv) Ancestors
 (v) Level
 (vi) Height or depth

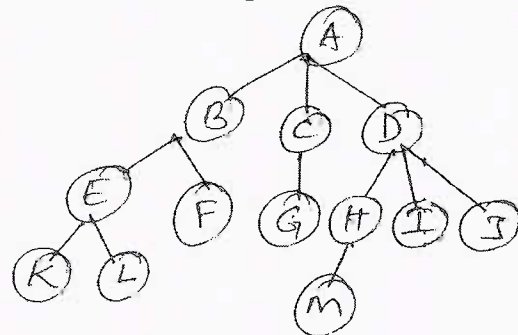


Fig. Q7(a)

- b. Explain Binary tree using Array representation and linked representation, which representation is more suitable and why? (06 Marks)
- c. Write a note on threaded binary trees and write the rules to construct the threads. (05 Marks)

OR

- 8 a. Define binary search tree, write a function for recursive or iterative search for BST. (06 Marks)
- b. For the given data draw a binary search tree 1, 3, 8, 5, 7, 9, 10, 12, 15, 14, 13, 11, 6 (04 Marks)
- c. For a tree given below traverse the tree using inorder, preorder, postorder, traversals, write the C routines for any traversal. (06 Marks)

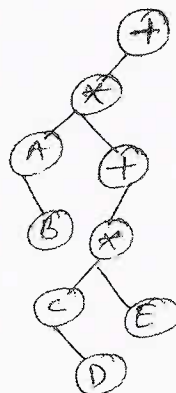
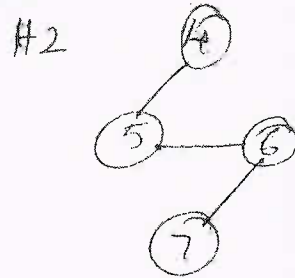
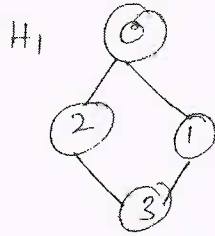


Fig. Q8(c)

Module-5

- 9 a. Define Graph, for the given graph G show adjacency matrix and adjacency list representation of the graph.

Graph with 2 components



- b. What are the methods used for traversing a graph, explain any one with example and write the function for the same. (08 Marks)

OR

- 10 a. Sort the following list of numbers using Radix sort:
45, 37, 05, 09, 06, 11, 18, 27 (04 Marks)
- b. What are the types of file organization? Explain any two. (08 Marks)
- c. Explain binary files, how are they different from text files. (04 Marks)

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Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Computer Organization

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. Define the functions of following processor registers :
 i) MAR ii) MDR iii) IP iv) IR. (04 Marks)
 b. How to measure the performance of a computer? Explain. (05 Marks)
 c. Compute the content of 8 bit register namely R1 and R2 containing a value of $-17_{(10)}$ and $+98_{(10)}$ with initial carry bit as 1 after performing following shift or rotate operations by 2 times. i) SHR R1, 2 ii) SAR R1, 2 [Arithmetic shift]
 iii) ROR R2, 2 iv) RCR R2, 2 [Rotate right with carry]. (07 Marks)

OR

- 2 a. What is the need of processor stack? Explain a commonly used layout for information in a subroutine stack frame. (06 Marks)
 b. With relevant examples briefly explain about any 2 encoding types of machine instruction. (05 Marks)
 c. With a memory layout starting at address 'i' represent how "ABCD" data is stored in big endian and little endian assignment scheme in a system of word length 16 bits. (05 Marks)

Module-2

- 3 a. Explain how simultaneous interrupt requests from several I/O devices can be handled by processor through a single INTR line. (06 Marks)
 b. What is bus arbitration? With neat diagram explain about distributed arbitration process. (06 Marks)
 c. With a neat diagram, explain about how data is read in asynchronous bus scheme. (04 Marks)

OR

- 4 a. Explain with a neat block diagram, the hardware components needed for connecting a keyboard to a processor. (08 Marks)
 b. With a neat sequence diagram explain the process of, how output operation is carried between processor and output device connected to host through USB hub. (08 Marks)

Module-3

- 5 a. With a neat diagram, explain the design of $2M \times 32$ memory module using $1M \times 8$ memory chips. (07 Marks)
 b. Consider a cache consisting of 256 blocks of 16 words each, for a total of 4096 words and assume main memory is addressable by 16 bit address and it consists of 4K blocks. How many bits are there in each of Tag, block/set and word fields for different mapping techniques? (09 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

- 6 a. Explain the process of address translation with a neat diagram. (06 Marks)
 b. With a neat diagram discuss about organization of magnetic disk. (06 Marks)
 c. Calculate the average access time experienced by processor if miss penalty is 17 clock cycles and Miss rate is 10% and cache access time is 1 clock cycle. (04 Marks)

Module-4

- 7 a. Design and explain the working of 16 bit carry look ahead adder built from 8 bit carry look ahead adder. Compare its performance with 16 bit ripple carry adder built from 8 bit ripple carry adder. (10 Marks)
 b. Calculate the product of $-2_{(10)}X + 14_{(10)}$ using bit pair recording multiplier method. Why bit pair method is better than Booth algorithm? (06 Marks)

OR

- 8 a. Perform the non restoring division for the given binary numbers where dividend is $1011_{(2)}$ and divisor is $0101_{(2)}$ with all cycles. (08 Marks)
 b. Represent $0.0625_{(10)}$ in double precision format and calculate the decimal value of A floating point number represented in single precision format as $44900000H$. (08 Marks)

Module-5

- 9 a. Write and discuss about micro-routine for complete execution of instruction Add (R1), R2 in single bus organization. (08 Marks)
 b. With a detailed block diagram explain about hardwired control unit. (08 Marks)

OR

- 10 a. With a block diagram explain briefly about an embedded processor. (06 Marks)
 b. Explain briefly about different ways of implementing multiprocessor system with supportive diagrams. (06 Marks)
 c. Write the control sequence for instruction Add R4, R5, R6 for 3 bus organization. (04 Marks)

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15CS35

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 UNIX and Shell Programming

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the UNIX architecture with a neat sketch. (08 Marks)
b. Explain the following commands: i) man-k ii) apropos iii) what is iv) ls-r. (04 Marks)
c. What is the output of the following commands:
i) date + % h ii) date + "% h % m" iii) echo "\$x" iv) cal. (04 Marks)

OR

- 2 a. Explain how to create a user or group. Along with the updations made in /etc/passwd file. (08 Marks)
b. What is the difference between internal and external command give example? (04 Marks)
c. Write a note on file and process. (04 Marks)

Module-2

- 3 a. Explain the parent child relationship UNIX. (08 Marks)
b. Write the output and tree structure for the following commands; assume present working directory is /home /vtu.
mkdir scheme
cd scheme
mkdir 2002/Branch 2006/Branch
cd 2002/Branch
mkdir CSE ECE ME
cd ../2006/Branch
mkdir CSE ECE ME
cd ../2002/Branch/ECE
pwd
cd ../2006/CSE
pwd. (08 Marks)

OR

- 4 a. What is the difference between absolute and relative path? (04 Marks)
b. Explain the output of ls-l command. (04 Marks)
c. Files current permissions are rw - r - xr - - specify chmod expression required to change them for the following:
i) rwxrwxrwx
ii) r - - r - - - -
iii) - - - - -
iv) - - - r - - r - - (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Explain the different modes in vi editor. (05 Marks)
 b. What is the output of the following commands:
 i) `ls [ijk] * .doc`
 ii) `ls [a-Z] ????.txt`
 iii) `ls foo * ? .txt`
 iv) `ls . * . *` (08 Marks)
 c. Explain the 3 standard UNIX files. (03 Marks)

OR

- 6 a. Write a note on shell variables. (04 Marks)
 b. With a suitable example. Explain the grep command and its various options. (08 Marks)
 c. Explain the following environmental variables i) SHELL ii) PATH (04 Marks)

Module-4

- 7 a. What is shell programming? Write a shell program that will do the following tasks in order:
 i) Clear the screen ii) Print current directory iii) Display current login users. (08 Marks)
 b. Explain the shell features of 'while' and 'for' with syntax. (04 Marks)
 c. Explain the following commands: i) umask ii) tail iii) head iv) pr. (04 Marks)

OR

- 8 a. What is the difference between hard link and soft link? (08 Marks)
 b. Write a shell script to test file attributes. (08 Marks)

Module-5

- 9 a. Write a Perl program to print numbers that are accepted from keyboard using 'for'. (08 Marks)
 b. Explain the mechanism of process creation. (08 Marks)

OR

- 10 a. Explain the process status command with its various options. (08 Marks)
 b. Write a Perl program to convert decimal number to binary. (08 Marks)

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15CS36

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Tautology. Verify the following compound proposition is a tautology or not :
 $\{(p \vee q) \rightarrow r\} \leftrightarrow \{\sim r \rightarrow \sim (p \vee q)\}$. (04 Marks)
- b. Check whether the following argument is valid or not :
 If I study, then I will not fail in exam.
 If I do not watch TV in the evenings, then I will study.
 I failed in exam.
 \therefore I must have watched TV in the evenings. (04 Marks)
- c. Define : i) open sentence ii) quantifiers. Write the following proposition in symbolic form and find its negation : "All integers are rational numbers and some rational numbers are integers". (04 Marks)
- d. Give a direct proof of the statement, "For all integers K and l, if K and l are both even then $K + l$ is even and Kl is even". (04 Marks)

OR

- 2 a. Define converse, inverse and contra positive of an implication. Hence find converse, inverse and contra positive for " $\forall x, (x > 3) \rightarrow (x^2 > 9)$ " where universal set is the set of real numbers R. (04 Marks)
- b. Using the laws of logic, prove the following logical equivalence :
 $[(\sim p \vee \sim q) \wedge (F_0 \vee p) \wedge P] \Leftrightarrow p \wedge \sim q$. (04 Marks)
- c. What are bound variables and free variables. Identify the same in each of the following expressions :
 i) $\forall y, \exists z \{ \cos(x + y) = \sin(z - x) \}$
 ii) $\exists x, \exists y \{ (x^2 - y^2) = z \}$. (04 Marks)
- d. Verify the validity of the following argument : If a triangle has two equal sides, then it is isosceles. If a triangle is isosceles, then it has two equal angles. The triangle ΔABC does not have two equal angles. $\therefore \Delta ABC$ does not have two equal sides. (04 Marks)

Module-2

- 3 a. Prove by mathematical induction $1.3 + 2.4 + 3.5 + \dots + n(n+2) = \frac{n(n+1)(2n+7)}{6}$. (04 Marks)
- b. Give a recursive definition for each of the following integer sequence :
 i) $a_n = 7n$ ii) $a_n = 2 - (-1)^n$ for $n \in \mathbb{Z}^+$. (04 Marks)
- c. How many positive integers can be formed by using the digits 3, 4, 4, 5, 5, 6, 7 to exceed 5,000,000? (04 Marks)
- d. In how many ways can we distribute seven apples and six oranges among four children so that each child receives at least one apple? (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 4 a. If F_0, F_1, F_2, \dots are Fibonacci numbers, then prove by induction $\sum_{i=1}^n \frac{F_{i-1}}{2^i} = 1 - \frac{F_{n+2}}{2^n}$. (04 Marks)
- b. A sequence $\{a_n\}$ is defined recursively as $a_1 = 7$ and $a_n = 2a_{n-1} + 1$ for $n \geq 2$. Find a_n in explicit form. (04 Marks)
- c. Find the number of arrangements of all the letters in the word "TALLAHASSEE". How many of these arrangements have no adjacent A's? (04 Marks)
- d. Find the coefficient of $w^3x^2yz^2$ in the expansion of $(2w - x + 3y - 2z)^8$. (04 Marks)

Module-3

- 5 a. Define Cartesian product of two sets. For any three non-empty sets A, B and C. Prove that $A \times (B - C) = (A \times B) - (A \times C)$. (04 Marks)
- b. Let f and g be two functions from R to R defined by $f(x) = 2x + 5$ and $g(x) = \frac{x-5}{2}$. Show that f and g are invertible to each other. (04 Marks)
- c. Define partition of a set. If R is a relation defined on $A = \{1, 2, 3, 4\}$ by $R = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 3), (3, 4), (4, 3), (4, 4)\}$, determine the partition induced by R. (04 Marks)
- d. Let $A = \{a, b, c\}$, $B = P(A)$ where P(A) is the power set of A. Let R be a subset relation on A. Show that (B, R) is a POSET and draw its Hasse diagram. (04 Marks)

OR

- 6 a. Let R be an equivalence relation on set A and $a, b \in A$. Then prove the following are equivalent :
 i) $a \in [a]$
 ii) $a R b$ iff $[a] = [b]$
 iii) if $[a] \cap [b] \neq \phi$ then $[a] = [b]$. (04 Marks)
- b. Prove that a function $f: A \rightarrow B$ is invertible iff it is one - one and onto. (04 Marks)
- c. State Pigeonhole principle. Show that if any seven numbers from 1 to 12 are chosen, then two of them will add to 13. (04 Marks)
- d. Show that the set of positive divisors of 36 is a POSET and draw its Hasse diagram. Hence find its i) least element ii) greatest element. (04 Marks)

Module-4

- 7 a. Out of 30 students in a hostel, 15 study history, 8 study economics and 6 study geography. It is known that 3 students study all these subjects. Show that 7 or more students study none of these subjects. (04 Marks)
- b. Define derangement. Find the number of derangements of 1, 2, 3, 4. List all these derangements. (04 Marks)
- c. Find the rook polynomial for the following board [refer Fig.Q7(c)] :

1	2			
3	4			
			5	6
			7	8
		9	10	11

Fig. Q7(c)

(04 Marks)

- d. The number of virus affected files in a system is 1000 (to start with) and this increases 250% every two hours. Use a recurrence relation to determine the number of virus affected files in the system after one day. (04 Marks)

OR

- 8 a. Determine the number of integers between 1 and 300 (inclusive) which are
 i) divisible by exactly two of 5, 6, 8 ii) divisible by at least two of 5, 6, 8. (04 Marks)
 b. In how many ways can the integers 1, 2, - - -, 10 be arranged in a line so that no even integer is in its natural place. (04 Marks)
 c. An apple, a banana, a mango and an orange are to be distributed to four boys B_1, B_2, B_3, B_4 . The boys B_1 and B_2 do not wish to have apple, the boy B_3 does not want banana or mango, B_4 refuses orange. In how many ways the distribution can be made so that no boy is displeased? (04 Marks)
 d. Solve the recurrence relation $F_{n+2} = F_{n+1} + F_n$ for $n \geq 0$ given that $F_0 = 0, F_1 = 1$. (04 Marks)

Module-5

- 9 a. Define the following with an example for each :
 i) Complete graph ii) regular graph iii) bipartite graph iv) complete bipartite graph. (04 Marks)
 b. Define isomorphism of two graphs. Verify the following graphs are isomorphic or not :
 [Refer Fig.Q9(b)] (04 Marks)



Fig.Q9(b)

- c. Show that a tree with n vertices has $n - 1$ edges. (04 Marks)
 d. Construct an optimal prefix code for the symbols a, o, q, u, y, z that occur with frequencies 20, 28, 4, 17, 12, 7 respectively. (04 Marks)

OR

- 10 a. Explain Konigsberg bridge problem. (04 Marks)
 b. Define the following with an example :
 i) subgraph ii) spanning subgraph
 iii) induced subgraph iv) edge-disjoint and vertex-disjoint subgraphs. (04 Marks)
 c. If a tree T has four vertices of degree 2, one vertex of degree 3, two vertices of degree 4 and one vertex of degree 5, find the number of leaves in T . (04 Marks)
 d. Obtain an optimal prefix code for the message ROAD IS GOOD. Indicate the code. (04 Marks)

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Third Semester B.E. Degree Examination, June/July 2019 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List any 4 differences between JFET and MOSFET. (04 Marks)
- b. Explain with help of neat diagram the working of N-channel JFET and sketch its characteristics. (08 Marks)
- c. With help of block diagram, explain the operation of a astable multivibrator using IC 555. (08 Marks)

OR

- 2 a. Sketch and explain the working of peak detector. (06 marks)
- b. State and explain any four performance parameters of an operational amplifier. (08 marks)
- c. Illustrate the various types of filters with neat diagram and definations. (06 Marks)

Module-2

- 3 a. Use a Karnaugh map to find minimum 80p form for the following Boolean function :
 $f(a, b, c, d) = \sum m(0, 2, 3, 5, 6, 7, 8, 9) + d(10, 11, 12, 13, 14, 15)$.
 Also draw the logic circuit diagram for the simplified SOP. (10 Marks)
- b. Apply Quine Mc-clusky method to find essential prime implicants for the Boolean function
 $f(a, b, c, d) = \sum m(1, 3, 6, 7, 10, 12, 13, 14, 15)$.
 Write prime implicant table. (10 Marks)

OR

- 4 a. There are 4 adjacent parking slots in Mega Inc. executive parking area. Each slot is equipped with sensor whose output is asserted high when a car is occupying the slot. Write a truth table so that the output is high if two or more vacant parking is available.
 - i) Write truth table
 - ii) Find the expression of the system that will signal the existence of two or more vacant slots
 - iii) Simplify the expression
 - iv) Draw the logic diagram for simplified expression. (10 Marks)
- b. Briefly explain an HDL implementation models. And write the HDL program for the following circuit shown in using in figure Fig.Q4(b) using structural model. (07 Marks)

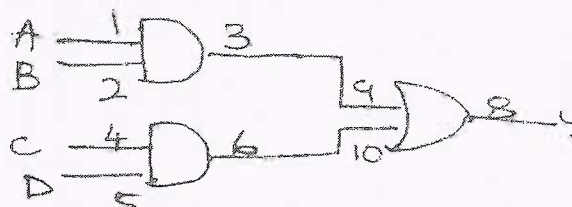


Fig.Q4(b)

- c. What is hazards? List the types of hazards. (03 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Implement the full adder outputs using 3 – 8 decoder. (07 marks)
 b. Design one bit magnitude comparator and implement it using de-multiplexer (08 Marks)
 c. Distinguish between combinational and sequential circuit. (05 Marks)

OR

- 6 a. Design a seven segment display using PLA. (10 Marks)
 b. Show how 1 : 4 de-multiplexer is used to get 1 : 16 de-multiplexer. (04 Marks)
 c. With the help of block diagram explain PAL and PLA. (06 Marks)

Module-4

- 7 a. The sequence 1011 is applied to the output of a 4 bit serial shift register that is initially cleared. With the help of diagram show how sequence is being entered serially into the register. (08 Marks)
 b. Design a self correcting modulo-6 counter in which all the unused state leads to state ABC = 000. (08 Marks)
 c. Draw the logic diagram, truth table and waveforms for a two flip-flop ripple counter. (04 Marks)

OR

- 8 a. Sketch a ring counter and Johnson counter and write its truth table. (08 Marks)
 b. Explain how toggle flip-flop is used as frequency divider circuit. Sketch the output waveforms. (08 Marks)
 c. A 4-bit binary asynchronous counter is connected. With a clock of 500 KHz frequency. Find the time period of the wave forms at the o/p of all the flop-flops. (04 Marks)

Module-5

- 9 a. Design synchronous counter for the sequence 1 – 3 – 5 – 7 – 1 using J-K flip-flop. (12 Marks)
 b. Explain digital clock with neat diagram. (04 Marks)
 c. Explain the terms accuracy and resolution for D/A converter. (04 Marks)

OR

- 10 a. Explain with block diagram the operation of successive approximation ADC. (08 Marks)
 b. Explain the binary ladder with digital input 1100. (08 Marks)
 c. For a 5 bit resistive divider, determine the following :
 i) Weight assigned to binary
 ii) Weight assigned to second and third LSB
 iii) The change in output voltage due to a change in the LSB, the second LSB and the third LSB
 iv) The output voltage for a digital input of 10101.
 Assume 0 = 0V and 1 = +10V.

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17CS33

Third Semester B.E. Degree Examination, June/July 2019 Data Structures and Applications

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Data structures. Give its classification. What are the basic operations that can be performed on data structure? (08 Marks)
- b. Give the ADT for sparse matrix. Express the given sparse matrix in the triplet form and find its transpose.

$$A = \begin{bmatrix} 10 & 0 & 0 & 25 & 0 \\ 0 & 23 & 0 & 0 & 45 \\ 0 & 0 & 0 & 0 & 32 \\ 42 & 0 & 0 & 31 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 30 & 0 & 0 \end{bmatrix}$$

(08 Marks)

- c. Consider the given 2 polynomials,
 $A(x) = 4x^{15} + 3x^4 + 5$ and $B(x) = x^4 + 10x^2 + 1$
 Represent the polynomials using Array of structures. (04 Marks)

OR

- 2 a. Explain the dynamic memory allocation functions in detail. (08 Marks)
- b. Write a C program using pointers to (i) Concatenate two strings, (ii) reverse a string. (06 Marks)
- c. Apply Knut-Morris-Pratt (KMP) pattern matching algorithm to search the pattern "abcdabcy" in the text "abcxabcdabxabcdababcdabcy". (06 Marks)

Module-2

- 3 a. Define stack data structure and give the ADT for stack. Write C functions for push() and pop() operations. (08 Marks)
- b. Convert the given infix expressions to postfix and prefix expression.
 (i) $(a + b) * d + e / (f + g * h) + i$
 (ii) $((a / (b - c + d)) * (e - f) * g)$ (06 Marks)
- c. Write an algorithm for evaluation of postfix expression. Trace the same for the expression $ab/c - de * t ac * t$ where $a = 6, b = 3, c = 1, d = 2, e = 4$. (06 Marks)

OR

- 4 a. Define recursion. Write C recursive functions for the following :
 (i) Tower of Hanoi (ii) Factorial of a give number. (07 Marks)
- b. Write C functions for insertcq() and deletcq() operations on a circular queue. (05 Marks)
- c. Explain in detail multiple stacks, with relevant functions in C. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Define linked lists. Explain in detail, the primitive operations performed on Supply Linked List (SLL). List the different types of linked lists. (12 Marks)
- b. Write C functions for the following operations on Doubly Linked List (DLL). (08 Marks)
- Concatenation of two DLL.
 - Search the DLL for the given key element.

OR

- 6 a. Write a C program to implement linked stacks. (08 Marks)
- b. Write an algorithm to add 2 polynomials using circular simply linked list (SLL). And also represent the given polynomial using CSLL. (08 Marks)
- $$P(x, y, z) = 6x^2y^2z - 4yz^5 + 3x^3yz + 2xy^5z - 2xyz^3$$
- c. For the given sparse matrix give the linked list representation. (04 Marks)

$$A = \begin{bmatrix} 0 & 0 & 4 & 0 & 0 \\ 6 & 5 & 0 & 0 & 0 \\ 0 & 3 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{bmatrix}$$

Module-4

- 7 a. Define tree data structure. Represent the tree given in Fig.Q7(a) using (i) List representation (ii) Left-Child Right-Sibling representation (iii) Degree-two or Binary tree representation.

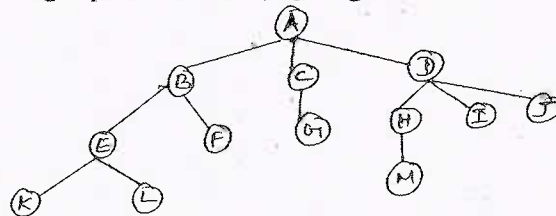


Fig.Q7(a)

(08 Marks)

- b. Write recursive C functions for in-order, pre-order, post-order traversals of binary tree (BT). Also give the 3 traversals for the BT shown in Fig.Q7(b). (12 Marks)

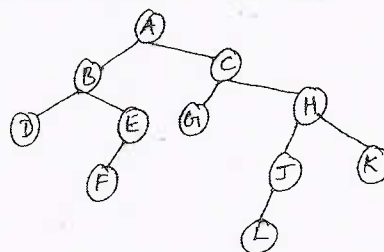


Fig.Q7(b)

OR

- 8 a. Define Binary Search Tree (BST). Construct BST for the element step-by-step, 100, 85, 45, 55, 110, 20, 70, 65, 113, 145, 132, 96 (08 Marks)
- b. Define threaded binary trees. Given in-order sequence: DJGBHEAFKIC and post-order sequence : JGDHEBKIFCA, construct BT for the same. (08 Marks)
- c. Write an algorithm for deleting a key element from BST. (04 Marks)

Module-5

- 9 a. Define the terminologies with example for graph data structure.
 (i) Graph (ii) Multigraph (iii) Complete graph. (06 Marks)
- b. Give the adjacency matrix and adjacency list representation for the weighted graph given in Fig.Q9(b). (06 Marks)

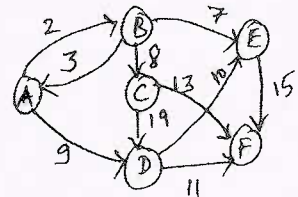


Fig.Q9(b)

- c. Write an algorithm for BFS and DFS graph traversal methods. (08 Marks)

OR

- 10 a. Apply insertion sort technique for the following elements : 77, 33, 44, 11, 88, 22, 66, 55. (08 Marks)
- b. Explain Hashing and collision. What are the methods used to resolve collision. (08 Marks)
- c. What are the basic operations that can be performed on a file? List the methods used for file organization (any 2). (04 Marks)

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17CS34

Third Semester B.E. Degree Examination, June/July 2019 Computer Organization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Write the basic performance equation. Explain the role of each of the parameters in the equation of the performance of the computer. (04 Marks)
- b. Draw and explain the connections between the processor and the main memory. (08 Marks)
- c. Write a program to evaluate the arithmetic statement $Y = (A + B) * (C + D)$ using three – address, two-address, one-address and zero – address instructions. (08 Marks)

OR

- 2 a. What is an addressing mode? Explain any four addressing modes with examples. (08 Marks)
- b. Explain the concept of stack frames, when subroutines are nested. (06 Marks)
- c. Explain the shift and rotate operations with examples. (06 Marks)

Module-2

- 3 a. Give comparison between memory mapped I/O and I/O mapped I/O. (04 Marks)
- b. Explain the following methods of handling interrupts from multiple devices.
 - i) Interrupt nesting /priority structure (08 Marks)
 - ii) Daisy chain method. (08 Marks)
- c. What is bus arbitration? Explain distributed arbitration with a neat diagram. (08 Marks)

OR

- 4 a. Draw neat timing diagrams and explain :
 - i) Multicycle synchronous bus transfer for a read operation.
 - ii) Asynchronous bus transfer for a write operation. (12 Marks)
- b. Explain the following with respect to USB.
 - i) USB architecture
 - ii) USB addressing. (08 Marks)

Module-3

- 5 a. With a neat diagram, explain the internal organization of a $2M \times 8$ dynamic memory chip. (08 Marks)
- b. Distinguish between SRAM and DRAM. (04 Marks)
- c. Describe any two mapping functions in cache. (08 Marks)

OR

- 6 a. What is virtual memory? With a diagram, explain how virtual memory address is translated? (08 Marks)
- b. Define the following :
 - i) Memory latency
 - ii) Memory bandwidth
 - iii) Hit-rate
 - iv) Miss-penalty. (04 Marks)
- c. Describe the working principle of a typical magnetic disk. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Convert the following pairs of decimal numbers to 5-bit signed 2's complement binary numbers and add them. State whether overflow has occurred.
i) -5 and 7 ii) -10 and -13 iii) -14 and 11. (06 Marks)
- b. Draw 4-bit carry-look ahead adder and explain. (06 Marks)
- c. Explain Booth's algorithm, multiply +15 and -6 using Booth's multiplication. (08 Marks)

OR

- 8 a. Explain the concept of carry-save addition for the multiplication operation $M \times Q = P$ for 4-bit operands, with diagram and suitable example. (08 Marks)
- b. Explain IEEE standard for floating - point numbers. (06 Marks)
- c. Perform the non-restoring division for $8 \div 3$ by showing all the steps. (06 Marks)

Module-5

- 9 a. Draw and explain multiple bus organization of CPU. And write the control sequence for the instruction Add R_4, R_5, B_6 for the multiple bus organization. (10 Marks)
- b. Explain with block diagram the basic organization of a micro programmed control unit. (10 Marks)

OR

- 10 a. With block diagram, explain the working of a microwave oven. (10 Marks)
- b. Explain the structure of general-purpose multiprocessors with diagrams. (10 Marks)

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17CS35

Third Semester B.E. Degree Examination, June/July 2019 UNIX and Shell Programming

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat diagram, explain the architecture of UNIX operating system. (08 Marks)
 b. Differentiate between internal and external commands in UNIX with suitable examples. (05 Marks)
 c. Write down the key combinations for managing the non-uniform behavior of key board and terminal for the following :
 i) Backspacing doesn't work
 ii) Killing a line
 iii) Interrupting a command
 iv) Terminating commands input
 v) Keyboard is locked
 vi) [Enter] key doesn't work
 vii) Terminal behaves in erratic manner (command). (07 Marks)

OR

- 2 a. Explain the salient features of UNIX operating system. (08 Marks)
 b. Differentiate between 'more' and 'less' page programs in UNIX. (04 Marks)
 c. List and describe the mandatory and optional sections of man page in UNIX operating system. (08 Marks)

Module-2

- 3 a. Illustrate with a neat diagram typical UNIX file system and explain different types of files supported in UNIX. (08 Marks)
 b. Assume you are in /home/Kumar, which of these commands will work when executed in sequence? Explain the proper reasons.
`mkdir a/b/c → mkdir a a/b`
`mkdir a a/b a/b/c → rmdir a/b/c → rmdir a a/b → mkdir a/p a/q a/p/r`
 Draw the final tree structure for directory 'a'. (07 Marks)
 c. Explain the following commands with an example. i) cd ii) pwd iv) rmdir v) wc. (05 Marks)

OR

- 4 a. Which command is used for listing file attributes? Explain the significance of each field in the output. (08 Marks)
 b. Explain the following commands with an example for each.
 i) cp ii) rm iii) mv iv) cat. (04 Marks)
 c. Current file permissions of a regular file "unix" are `rw__w__x`. Write chmod expressions required to change it to the following :
 i) `_wxrwxr_x` ii) `__ _r _xrw_` iii) `rwx_ _x _ _ _` iv) `r _ _ _ wx _ _ _`.
 Using both relative and absolute methods of assigning permissions. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Explain the three modes of vi. Indicate clearly how can you switch form one mode to another. Explain the following input mode commands : i, I, a A, r, R, o, O, s, S. (10 Marks)
- b. Explain what these wild-card pattern match
 i) [A-Z]???? * ii) *[^0-9]* iii) *.[!t][!x][!t] (06 Marks)
- c. Explain the navigation keys for the following types of navigations in vi editor.
 i) Movement in four directions
 ii) Word navigation. (04 Marks)

OR

- 6 a. With suitable examples, explain the 'grep' command with its various options. (06 Marks)
- b. Briefly explain Basic Regular Expression (BRE) and Extended Regular Expression (ERE) metacharacters. (10 Marks)
- c. Write a regular expression to match the following i) a decimal number which is non negative and floating point number ii) A valid 'C' variable. (04 Marks)

Module-4

- 7 a. Explain the following commands with an example for each. i) head ii) tail iii) cut iv) paste. (08 Marks)
- b. What is shell programming? Write a shell program to create a simple calculator which can perform basic arithmetic operations like addition, subtraction, multiplication or division, depending upon the user input. (10 Marks)
- c. Write the syntax for if-else-fi statement in shell programming. (02 Marks)

OR

- 8 a. Write a shell program to get the following details of the student. Name, age, USN and gender. Output all the details to the terminal. And also output whether the student is eligible to vote or not with suitable messages. (08 Marks)
- b. Distinguish between hard links and soft links. (04 Marks)
- c. Write and explain the syntax of 'while' and 'for' loops in shell programming. (08 Marks)

Module-5

- 9 a. Write a Perl script to determine whether the given year is a leap year or not. (08 Marks)
- b. What is the difference between a job and a process? How do you i) suspend the foreground job ii) move a suspended job to the background iii) bring back a suspended job to the foreground? (06 Marks)
- c. Explain the mechanism of process creation. (06 Marks)

OR

- 10 a. Explain the following string handling functions of PERL with example :
 i) length ii) index iii) substr iv) reverse. (08 Marks)
- b. Explain the following commands :
 i) at ii) cron iii) nice iv) nohup. (08 Marks)
- c. With suitable examples, explain 'split' and 'join' functions in PERL. (04 Marks)

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17CS36

Third Semester B.E. Degree Examination, June/July 2019 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define tautology. Verify that $[p \rightarrow (q \rightarrow r)] \rightarrow [(p \rightarrow q) \rightarrow (p \rightarrow r)]$ is a tautology. (06 Marks)
- b. If statement q has truth value 1, determine all truth value assignments for the primitive statements p, r, s for which the truth value of the statement :
 $(q \rightarrow [(\neg p \vee r) \wedge \neg s]) \wedge [\neg s \rightarrow (\neg r \wedge q)]$ is 1. (04 Marks)
- c. Establish the following logical equivalence :
 i) $p \vee q \vee (\neg p \wedge \neg q \wedge r) \Leftrightarrow p \vee q \vee r$
 ii) $[(\neg p \vee \neg q) \rightarrow (p \wedge q \wedge r)] \Leftrightarrow p \wedge q$. (10 Marks)

OR

- 2 a. Establish the validity of following arguments :
- | | |
|--|---|
| $\begin{array}{l} \neg p \vee \neg q \rightarrow (r \wedge s) \\ r \rightarrow t \\ \neg t \\ \hline \therefore p \end{array}$ | $\begin{array}{l} u \rightarrow r \\ (r \wedge s) \rightarrow (p \vee t) \\ q \rightarrow (u \wedge s) \\ \neg t \\ q \\ \hline \therefore p \end{array}$ |
|--|---|
- (08 Marks)
- b. Let p(x), q(x) and r(x) be the following open statements :
 $p(x) : x^2 - 7x + 10 = 0$ $q(x) : x^2 - 2x - 3 = 0$ $r(x) : x < 0$.
 Determine truth or falsity of following statements, where universe is all integers. If a statement is false, provide a counter example.
 i) $\forall x [p(x) \rightarrow \neg r(x)]$ ii) $\forall x [q(x) \rightarrow r(x)]$
 iii) $\exists x [q(x) \rightarrow r(x)]$ iv) $\exists x [p(x) \rightarrow r(x)]$. (08 Marks)
- c. Prove that for all integers 'k' and 'l', if 'k' and 'l' are both even, then k + l is even and kl is even by direct proof. (04 Marks)

Module-2

- 3 a. Define well ordering principle and prove the following by mathematical induction :
- i) $1^2 + 3^2 + 5^2 + \dots + (2n-1)^2 = \frac{n(2n-1)(2n+1)}{3}$
- ii) $1*3 + 2*4 + 3*5 + \dots + n(n+2) = \frac{n(n+1)(2n+7)}{6}$. (12 Marks)
- b. Find the coefficients of :
- i. $x^9 y^3$ in the expansion of $(2x - 3y)^{12}$
- ii. $a^2 b^3 c^2 d^5$ in the expansion of $(a + 2b - 3c + 2d + 5)^{16}$. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 4 a. A woman has 11 close relatives and she wishes to invite 5 of them to dinner. In how many ways can she invite them in following situations,
- There is no restriction on the choice
 - Two particular persons will not attend separately
 - Two particular persons will not attend together.
- (06 Marks)
- b. How many arrangements are there for all letters in word SOCIOLOGICAL? In how many of these arrangements all vowels are adjacent. (06 Marks)
- c. For the Fibonacci sequence F_0, F_1, F_2, \dots prove that $F_n = \frac{1}{\sqrt{5}} \left[\left(\frac{1+\sqrt{5}}{2} \right)^n - \left(\frac{1-\sqrt{5}}{2} \right)^n \right]$. (08 Marks)

Module-3

- 5 a. Let $A = \{1, 2, 3, 4\}$ and $B = \{1, 2, 3, 4, 5, 6\}$.
- How many functions are there from A to B?
 - How many of these are one to one?
 - How many are onto?
 - How many functions are there from B to A?
 - How many of these are onto?
 - How many are one to one?
- (06 Marks)
- b. A computer operator is given a magnetic tape that contains 500,000 words of four or fewer lowercase letters. Can it be that the 500,000 words are all distinct? (06 Marks)
- c. Let $f, g, h : \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = x^2$, $g(x) = x + 5$ and $h(x) = \sqrt{x^2 + 2}$. Show that $(h \circ g) \circ f = h \circ (g \circ f)$. (08 Marks)

OR

- 6 a. Let $A = \{1, 2, 3, 6, 9, 18\}$ and define R on A by xRy if "x divides y". Draw the Hasse diagram for the poset (A, R). Also write the matrix of relation. (08 Marks)
- b. Consider Poset whose Hasse diagram is given below. Consider $B = \{3, 4, 5\}$. Find upper and lower bounds of B, least upper bound and greatest lower bound of B. (04 Marks)
(Ref. Fig.Q6(b)).

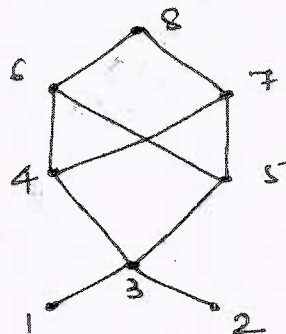


Fig.Q6(b)

- c. Let $A = \{1, 2, 3, 4, 5\} \times \{1, 2, 3, 4, 5\}$ and define R on A by $(x_1, y_1) R (x_2, y_2)$ if $x_1 + y_1 = x_2 + y_2$.
- Verify that R is an equivalence relation on A
 - Determine equivalence classes $[(1, 3)]$, $[(2, 4)]$ and $[(1, 1)]$
 - Determine partition of A induced by R.
- (08 Marks)

Module-4

- 7 a. In how many ways can the 26 letters of English alphabet be permuted so that none of the patterns CAR, DOG, PUN or BYTE occurs? (08 Marks)
- b. There are eight letters to eight different people to be placed in eight different addressed envelopes. Find the number of ways of doing this so that atleast one letter gets to right person. (04 Marks)
- c. Four persons P_1, P_2, P_3, P_4 who arrive late for a dinner party find that only one chair at each of five table T_1, T_2, T_3, T_4 and T_5 is vacant. P_1 will not sit at T_1 or T_2 , P_2 will not sit at T_2 , P_3 will not sit at T_3 or T_4 and P_4 will not sit at T_4 or T_5 . Find the number of ways they can occupy the vacant chairs. (08 Marks)

OR

- 8 a. Find the recurrence relation and the initial condition for the sequence 0, 2, 6, 12, 20, 30, 42, Hence find the general term of the sequence. (10 Marks)
- b. If $a_0 = 0, a_1 = 1, a_2 = 4$ and $a_3 = 37$ satisfy the recurrence relation $a_{n+2} + ba_{n+1} + ca_n = 0$ for $n \geq 0$, determine the constants b and c and then solve the relation for a_n . (10 Marks)

Module-5

- 9 a. Merge sort the list $-1, 7, 4, 11, 5, -8, 15, -3, -2, 6, 10, 3$. (06 Marks)
- b. Determine whether the following graphs are isomorphic or not. (06 Marks)

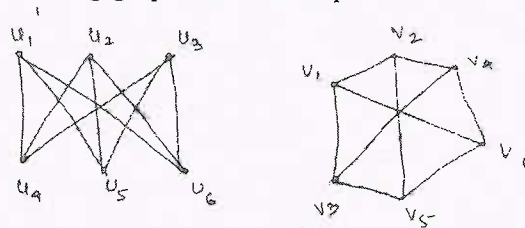


Fig.Q9(b)

- c. Define the following with an example to each.
 i) Simple graph ii) Complete graph iii) Regular graph iv) Spanning sub graph v) Induced subgraph vi) Complete Bipartite graph vii) Tree viii) Complement of graph. (08 Marks)

OR

- 10 a. Define trail, circuit, path, cycle. In the graph shown below determine : [Ref.Q10(a)]
 i. a walk from b to d that is not a trail
 ii. b - d trail that is not a path
 iii. a path from b to d
 iv. a closed walk from b to b that is not a circuit
 v. a circuit from b to b that is not cycle
 vi. a cycle form b to b . (10 Marks)

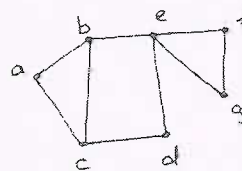


Fig.Q10(a)

- b. Define optimal tree and construct an optimal tree for a given set of weights $\{4, 15, 25, 5, 8, 16\}$. Hence find the weight of optimal tree. (06 Marks)
- c. Prove that in a graph. The sum of degrees of all vertices is an even number and is equal to twice the number of edges in the graph. (04 Marks)

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15CS32

Third Semester B.E. Degree Examination, June/July 2019 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain with help of a circuit diagram and characteristic curves working of N-channel Enhancement – MOSFET (E-MOSFET) (10 Marks)
- b. Explain any two applications of field Effect Transistor (FET) along with the circuit diagram. (06 Marks)

OR

- 2 a. Explain the operation of Astable multi-vibrator with a neat diagram. (08 Marks)
- b. Explain performance parameters of operational amplifiers. (08 Marks)

Module-2

- 3 a. Describe positive and negative logic. list the equivalences between them. (04 Marks)
- b. Simplify the following boolean function using k-map method.
 $F(A, B, C, D) = \pi M(0, 1, 2, 4, 5, 10) + d(8, 9, 11, 12, 13, 15)$
 Get the simplified POS form of k-map. (04 Marks)
- c. What is a Hazard? Explain Static – 0 hazard and its Hazard cover. (08 Marks)

OR

- 4 a. Give simplified logic equation using Quine-McClusky method for the following Boolean function $F(A, B, C, D) = \sum m(0, 3, 5, 6, 7, 11, 14)$. (12 Marks)
- b. Mention the different verilog HDL model and write the verilog HDL code using structural model for the circuit given in Fig Q4(b)

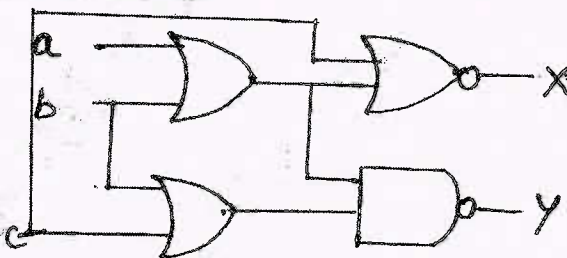


Fig Q4(b)

(04 Marks)

Module-3

- 5 a. Implement the following function using 8:1 multiplexer
 $F(A, B, C, D) = \sum m(0, 1, 5, 6, 8, 10, 12, 15)$ (06 Marks)
- b. Show that using a 3:8 decoder and multi-input OR gate, the following boolean expression can be realized $F_1(A, B, C) = \sum m(0, 4, 6)$
 $F_2(A, B, C) = \sum m(1, 2, 3, 7)$ (04 Marks)
- c. Design even parity generator. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Design seven segment decoder using Programmable Logic Array (PLA) (08 Marks)
b. What is Magnitude comparator? Design one bit comparator using basic gates? (08 Marks)

Module-4

- 7 a. Explain the working of a JK master – slave Flip – Flop along with its implementation using NAND gates. (08 Marks)
b. Draw the state transition tables of JK, T, D and SR Flip – Flops. (08 Marks)

OR

- 8 a. Explain a 4-bit serial – In – Serial – out (SISO) registers using negative edge triggered D-Flip-Flops. Draw the waveform to shift binary number 1111 into this register. (08 Marks)
b. Write the comparison between synchronous and asynchronous counter. (04 Marks)
c. Explain Ring counter with a neat diagram. (04 Marks)

Module-5

- 9 a. Define counter. Design and Implement a MOD – 5 synchronous counter using JK Flip-Flop. (10 Marks)
b. With a neat diagram explain Digital clock. (06 Marks)

OR

- 10 a. Explain 2 bit simultaneous A/D converter. (10 Marks)
b. Explain the Binary ladder with digital input of 0100. (06 Marks)

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CBCS SCHEME

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15CS33

Third Semester B.E. Degree Examination, June/July 2019

Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is a Pointer? How do you declare and initialize the pointer? How do you access the value pointed to by a pointer. (06 Marks)
- b. What is Self-referential structure? List the difference between structure and union. (06 Marks)
- c. What is String? Explain the following string functions with examples :
i) STRTOK ii) STRCAT iii) SUBSTR. (04 Marks)

OR

- 2 a. Write appropriate structure definition and variable declarations to store following information about 50 students :
Name , USN , GENDER , DOB and Marks in three subjects S₁, S₂ and S₃ . Date of birth should be a structure containing fields day , month and year. (06 Marks)
- b. What is Dynamically allocated arrays? Explain with suitable example. (05 Marks)
- c. What is pointer to pointer? Give the following declaration.
int a = 8 ;
int b = 9 ;
int *b = &a ;
int *2 = &b ;
What is the value of each of the following expression?
i) ++ a ii) ++(*p) iii) --(*q) iv) --b. (05 Marks)

Module-2

- 3 a. Define Stack? List the operations of on stack. Write the C implementation of these operations. (08 Marks)
- b. Write an algorithm for evaluating a valid postfix expression. Trace the same on
562 + * 841 - (08 Marks)

OR

- 4 a. What is Recursion? Write a C implementation for Tower of Hanoi. (08 Marks)
- b. What is a Queue? List different types of Queue. Write C implementation for insertQ() and deleteq() operation. (08 Marks)

Module-3

- 5 a. What is a linked list? List different types of linked list. Write a C function to count number of elements present in a singly linked list. (08 Marks)
- b. How can an ordinary queue be represented using a singly linked list? Write C functions for linked implementation of ordinary queue insertion and deletion. (08 Marks)

OR

- 6 a. What is doubly linked list? Write a C program to perform the following operations on doubly linked list i) Insert a node ii) Delete a node. (08 Marks)
 b. Explain the following with suitable example i) Circular linked list ii) Doubly linked list. (08 Marks)

Module-4

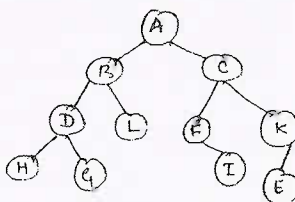
- 7 a. What is a Tree? List traversing Binary tree. Write algorithm for these tree traversal. (07 Marks)
 b. Construct a binary tree from the traversal order given below :

Preorder :	A	B	D	E	F	C	G	H	L	J	K
Inorder :	D	B	F	E	A	G	C	L	J	H	K

- (05 Marks)
 c. What is Threaded Binary tree? Explain right in an left in threaded binary trees. (04 Marks)

OR

- 8 a. Construct a binary tree for given expression $((6 + (3-2) * 5) ^ 2 + 3)$. (06 Marks)
 b. Given the following graph, write inorder, preorder and postorder traversals. (04 Marks)



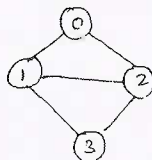
- c. Define the following : i) Binary tree ii) Complete binary tree iii) Almost complete binary tree iv) Binary search tree. (06 Marks)

Module-5

- 9 a. How an Insertion sort works? Suppose an array A contains 8 elements as follows : 77, 33, 44, 11, 88, 22, 66, 55. Trace insertion sort algorithm for sorting in ascending order. (06 Marks)
 b. What is Hashing? Explain with example hash following hashing function :
 i) Division method ii) Midsquare method iii) Folding method. (06 Marks)
 c. Define following terms : i) Graph ii) Multigraph iii) Graph with self edge iv) Subgraph. (04 Marks)

OR

- 10 a. Define Adjacency matrix and Adjacency list. Also show the adjacency matrix and adjacency List for the given graph. (08 Marks)



- b. Consider the following 4 – digit employee number 9614 , 5882 , 6713 , 4409 , 1825. Find the 2 – digit hash address of each number using
 i) The division method with = 97.
 ii) The midsquare method.
 iii) The folding method without reversing.
 iv) The folding method with reversing. (08 Marks)

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15CS34

Third Semester B.E. Degree Examination, June/July 2019
Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the connection between processor and memory with neat diagram and show how to add $A + B$ to form C with the help of the same diagram. (08 Marks)
- b. Write short notes on :
 (i) Performance equation (ii) SPEC Rating (08 Marks)

OR

- 2 a. What do you mean by addressing mode? Explain different types of addressing modes with example. (10 Marks)
- b. Explain shift and rotate instructions with example. (06 Marks)

Module-2

- 3 Write short notes on :
 (i) Daisy chain (ii) Subroutine (iii) Interrupt hardware (iv) Exception (16 Marks)

OR

- 4 a. Explain how DMA (with register) is taking place in a system with necessary diagram. (08 Marks)
- b. Define Bus arbitration. Discuss different types of Bus Arbitration methods with diagram. (08 Marks)

Module-3

- 5 a. With diagram, describe the internal organization of a 128×8 memory chip. (08 Marks)
- b. With the diagram of basic SRAM (Static RAM) and DRAM (Asynchronous DRAM) chip (cell), explain the read and write operations on each of them. (08 Marks)

OR

- 6 a. Describe different types of cache mapping techniques (between memory to cache memory) with diagram. (10 Marks)
- b. Calculate the total capacity of a 4.8 inch disk having the following parameters:
 (i) 100 data recording surfaces (ii) 100000 tracks per surface (iii) 100 sectors per track
 (iv) Each track contains 512 bytes of data. (03 Marks)
- c. In a given system (i) hit rate (h) = 0.5 (ii) Miss penalty (M) = 100 ns (iii) Time to access cache memory (c) = 100 ns. Calculate the average access time (t_{ave}) experienced by the processor. (03 Marks)

Module-4

- 7 a. Write down the steps of Booths multiplication algorithm. (02 Marks)
- b. Perform Booths multiplication between $(+13) \times (-6)$. (08 Marks)
- c. Explain generation and propagation functions used in Carry-Look-Ahead Adder. (06 Marks)

OR

- 8 a. Explain Bit-Pair Recording / Fast multiplication with example. (08 Marks)
b. Write down the steps of restoring division algorithm. Apply Restoring division algorithm on 1000/11. (08 Marks)

Module-5

- 9 a. Describe Multiple Bus Organization (with diagram). (08 Marks)
b. Write down the control sequence for execution of the instruction Add (R₃), R₁ (08 Marks)

OR

- 10 a. What do you mean by micro-instruction? Design Basic organization of a microprogrammed control unit with diagram. (08 Marks)
b. Describe a simple microcontroller with diagram. Also mention parallel and serial I/O port in brief. (08 Marks)

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Third Semester B.E. Degree Examination, June/July 2019 UNIX and Shell Programming

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat diagram, explain the architecture of UNIX operating system. (08 Marks)
 b. Describe the salient features of UNIX operating system. (08 Marks)

OR

- 2 a. Explain the following commands with example:
 i) who ii) echo iii) date (06 Marks)
 b. What are internal and external commands? List any two examples. (04 Marks)
 c. With the help of examples, explain (i) man man (ii) apropos (06 Marks)

Module-2

- 3 a. Explain the different types of files supported in UNIX. (06 Marks)
 b. What is parent-child relationship? With the help of neat diagram, explain UNIX file system tree. (06 Marks)
 c. With suitable example, bring out the difference between absolute and relative pathnames. (04 Marks)

OR

- 4 a. Briefly describe the significance of the seven fields of the 'ls -l' command. (08 Marks)
 b. File current permissions are rw__w_r___. Write chmod expression required to change them for the following:
 (i) r__r__x (ii) rwxrwx__x (iii) r_x r_x r_x (iv) rwxrwxr__
 using both relative and absolute methods of assigning permissions. (08 Marks)

Module-3

- 5 a. What are the different modes of operations in Vi editor? Explain with a suitable diagram. (08 Marks)
 b. Write the output for the following UNIX commands:
 i) mv * ../bin ii) cp ?????? prog
 iii) lp note[0-1][0-9] iv) rm *-[!l][!o][!g] (04 Marks)
 c. Explain concept of Escaping and Quoting with suitable example. (04 Marks)

OR

- 6 a. What are the three standard files in UNIX? (06 Marks)
 b. Explain 'grep' command with its options. (06 Marks)
 c. Write the output of the following:
 i) sed '3q' abc
 ii) ls -l/grep '^d' >directories
 iii) sed -n 'Sp' abc
 iv) sed -n '3, S!p' abc (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain the following environment variables with example each:
i) SHELL ii) LOGNAM iii) PATH iv) PS1 (04 Marks)
b. Explain sort command with options. (08 Marks)
c. What are hard link and symbolic links? (04 Marks)

OR

- 8 a. Explain special parameters used by the shell. (08 Marks)
b. Write a menu driven shell script to display list of files, process of user, today's date and users of the system. (08 Marks)

Module-5

- 9 a. Explain the mechanism of process creation using system in UNIX. (06 Marks)
b. Explain here document (<<) with an example. Also mention its use. (04 Marks)
c. Explain the following commands with example: (i) kill (ii) bg (iii) fg (06 Marks)

OR

- 10 a. Explain split and join functions with example. (04 Marks)
b. How is file managed in perl? Explain with an example. (04 Marks)
c. Using command line arguments, write a Perl program to find whether a given year is leap. (06 Marks)

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15CS36

Third Semester B.E. Degree Examination, June/July 2019 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Simplify the switching network shown in Fig Q1(a)

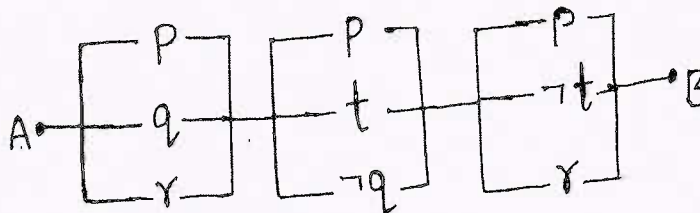


Fig Q1(a)

(08 Marks)

- b. Give a direct proof of the statement "If n is an odd integer then n^2 is also an odd integer".
(04 Marks)
- c. Let p(x), q(x) and r(x) be open statements that are defined for the given universe. Show that the argument.

$$\forall x, [p(x) \rightarrow q(x)]$$

$$\forall x, [q(x) \rightarrow r(x)]$$

$$\therefore \exists x, [p(x) \rightarrow r(x)] \text{ is valid}$$

(04 Marks)

OR

- 2 a. Define tautology, prove that for any proposition p, q, r the compound proposition $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r)$ is a tautology using truth table.
(05 Marks)
- b. Show that RVS follows logically from the premises CVD, $CVD \rightarrow \neg H$, $\neg H \rightarrow (A \wedge \neg B)$ and $(A \wedge \neg B) \rightarrow (RVS)$.
(04 Marks)
- c. Using rules of inference shows that the following argument is valid.
 $\forall x, [p(x) \vee q(x)] \wedge \exists x, \neg p(x) \wedge$
 $\forall x, [\neg q(x) \vee r(x)] \wedge \forall x, [s(x) \rightarrow \neg r(x)]$
 $\therefore \exists x, \neg s(x)$
(07 Marks)

Module-2

- 3 a. Prove by mathematical induction that, for all integers $n \geq 1$, $1 + 2 + 3 + \dots + n = \frac{1}{2}n(n+1)$.
(06 Marks)
- b. The Fibonacci numbers are defined recursively by $F_0 = 0$, $F_1 = 1$, $F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$. Evaluate F_2 to F_{10} .
(04 Marks)
- c. In the word S, O, C, I, O, L, O, G, I, C, A, L.
i) How many arrangements are there for all letters?
ii) In how many of these arrangements all vowels are adjacent?
(06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8=50, will be treated as malpractice.

OR

- 4 a. Obtain the recursive definition for the sequence $\{a_n\}$ in each of the following cases.
 (i) $a_n = 5n$ (ii) $a_n = 6^n$ (iii) $a_n = n^2$ (06 Marks)
- b. Find the coefficient of
 i) $x^9 y^3$ in the expansion of $(2x - 3y)^{12}$
 ii) x^{12} in the expansion of $x^3(1 - 2x)^{10}$ (04 Marks)
- c. A message is made up of 12 different symbols and is to be transmitted through a communication channel. In addition to the 12 symbols, the transmitter will also send a total of 45 blank spaces between the symbols, with at least 3 spaces between each pair of consecutive symbols. In how many ways can the transmitter send such a message? (06 Marks)

Module-3

- 5 a. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \begin{cases} 3x - 5 & \text{for } x > 0 \\ -3x + 1 & \text{for } x \leq 0 \end{cases}$$
 determine $f(0)$, $f(-1)$, $f^{-1}(0)$, $f^{-1}(+3)$, $f^{-1}([-5, 5])$ (08 Marks)
- b. Define an equivalence relation. Write the partial order relation for the positive divisors of 36 and write its Hasse diagram (HASSE). (08 Marks)

OR

- 6 a. Consider the function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 2x + 5$. Let a function $g: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $g(x) = \frac{1}{2}(x - 5)$. Prove that g is an inverse of f . (03 Marks)
- b. State Pigeonhole principle. Let ABC is an equilateral triangle whose sides are of length 1cm each. If we select 5 points inside the triangle, prove that atleast two of their points are such that the distance between them is less than $\frac{1}{2}$ cm. (05 Marks)
- c. If $A = \{1, 2, 3, 4\}$, R and S are relations on A defined by $R = \{(1, 2), (1, 3), (2, 4), (4, 4)\}$
 $S = \{(1, 1), (1, 2), (1, 3), (1, 4), (2, 3), (2, 4)\}$ find $R \circ S$, $S \circ R$, R^2 , S^2 and write down their matrices. (08 Marks)

Module-4

- 7 a. Find the number of derangements of 1, 2, 3, 4 list all such derangements. (04 Marks)
- b. Determine the number of integers between 1 and 300 (inclusive) which are divisible by exactly 2 of 5, 6, 8. (06 Marks)
- c. The number of virus affected files in a system is 1000 (to start with) and this increases 250% every two hours. Use a recurrence relation to determine the number of virus affected files in the system after one day? (06 Marks)

OR

- 8 a. Five teachers T_1, T_2, T_3, T_4, T_5 are to be made class teachers for 5 classes C_1, C_2, C_3, C_4, C_5 one teacher for each class T_1 and T_2 donot wish become the class teachers for C_1 or C_2 , T_3 and T_4 for C_4 or C_5 and T_5 for C_3 or C_4 or C_5 . In how many ways can teachers be assigned the work (without displeasing any teacher)? (08 Marks)
- b. Solve the recurrence relation,
 $a_n = 2(a_{n-1} - a_{n-2})$, where $n \geq 2$ and $a_0 = 1, a_1 = 2$. (08 Marks)

Module-5

- 9 a. Prove that the undirected graph $G = (V, E)$ has an Euler circuit if and only if G is connected and every vertex in G has even degree. (08 Marks)
- b. Define binary rooted tree and Balanced tree. Draw all the spanning trees of the graph shown in Fig 9(b)

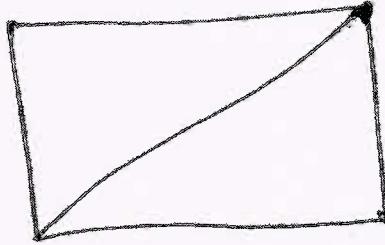


Fig Q9(b)

(08 Marks)

OR

- 10 a. Define, with an example for each Regular graph, complement of a graph, Euler trail and Euler circuit and complete graph. (10 Marks)
- b. Apply Merge sort to the list
6, 2, 7, 3, 4, 9, 5, 1, 8 (06 Marks)

CBCS SCHEME

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17CS42

Fourth Semester B.E. Degree Examination, June/July 2019

Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the various features of OOC. (08 Marks)
- b. What is a constructor? Mention its types. Explain the parameterized constructor with a suitable code. (08 Marks)
- c. Give the difference between procedure oriented programming and object oriented programming. (04 Marks)

OR

- 2 a. What is an inline function? Write a C++ function to find the maximum of 2 numbers using inline. (08 Marks)
- b. Why friend function is required? Write a program to add two numbers using friend function. (08 Marks)
- c. Write short note on function overloading. (04 Marks)

Module-2

- 3 a. List and explain the Java Buzzwords. (08 Marks)
- b. Describe the concept of bytecode. (04 Marks)
- c. Develop the program to calculate the average among the elements {4, 8, 10, 12} using foreach in java. How foreach is different from for? (08 Marks)

OR

- 4 a. List the different types of operators. Explain any three. (08 Marks)
- b. What is an array? List the types and explain any one with a suitable code. (06 Marks)
- c. Explain switch case with an example. (06 Marks)

Module-3

- 5 a. Explain the packages in Java with an example. (08 Marks)
- b. Explain the interfaces in java using suitable code. (08 Marks)
- c. Write short notes on "this" keyword with an example. (04 Marks)

OR

- 6 a. Explain exception handling with a suitable code. (08 Marks)
- b. Explain the java garbage collector. (08 Marks)
- c. Write short notes on "super" keyword, with an example. (04 Marks)

Module-4

- 7 a. Explain the concepts of multithreading in Java. Explain the two ways of making class threadable with examples. (10 Marks)
- b. With a syntax, explain isAlive() and join() with suitable program. (10 Marks)

OR

- 8 a. Write short notes on Event Listener interface and explain any two interfaces with syntax. (08 Marks)
b. Write short notes on Event class and explain any two with syntax. (08 Marks)
c. How inner classes are used in Java? Explain. (04 Marks)

Module-5

- 9 a. What is an applet? Explain the life cycle of an applet. (10 Marks)
b. Explain passing parameters in Applets. (10 Marks)

OR

10 Explain the following with a suitable code:

- i) JLabel
- ii) JTextField
- iii) JList
- iv) JTable.

(20 Marks)

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Fourth Semester B.E. Degree Examination, June/July 2019 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Design an algorithm to search an element in a array using sequential search. Discuss the worst case, best case and average case efficiency of this algorithm. (08 Marks)
- b. Discuss adjacency matrix and adjacency list representation of a graph with suitable example. (06 Marks)
- c. Give the recursive algorithm to solve towers of Hanoi problem. Show that the efficiency of this algorithm is exponential. (06 Marks)

OR

- 2 a. Give the general plan for analyzing time efficiency of non recursive algorithms. Derive the worst case analysis for the algorithm to check whether all the elements in a given array are distinct. (08 Marks)
- b. List and define any three asymptotic notations. What are the various basic asymptotic efficiency classes? (06 Marks)
- c. Explain the following types of problems: (06 Marks)
 - (i) Combinatorial problems
 - (ii) Graph problems.

Module-2

- 3 a. Write an algorithm to sort 'n' numbers using Quick sort. Trace the algorithm to sort the following list in ascending order. (08 Marks)

80 60 70 40 10 30 50 20
- b. Discuss general divide and conquer technique with control abstraction and recurrence relation. (06 Marks)
- c. Apply DFS based algorithm and source removal method to find the topological sequence for the graph shown in Fig.Q3(c). (06 Marks)

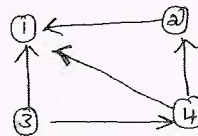


Fig. Q3(c)

OR

- 4 a. Apply Strassen's matrix multiplication to multiply following matrices. Discuss how this method is better than direct matrix multiplication method. (08 Marks)

$$\begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix} \times \begin{bmatrix} 2 & 5 \\ 1 & 6 \end{bmatrix}$$
- b. Write recursive algorithm to find maximum and minimum element in an array. (06 Marks)
- c. Write an algorithm to sort 'n' number using merge sort. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Write an algorithm to solve knapsack problem using Greedy technique. Find the optimal solution to the knapsack instance $n = 7, m = 15$
 $(P_1, P_2, \dots, P_7) = (10, 5, 15, 7, 6, 18, 3)$
 $(W_1, W_2, \dots, W_7) = (2, 3, 5, 7, 1, 4, 1)$ (10 Marks)
- b. Apply Prim's algorithm and Kruskal's method to find the minimum cost spanning tree to the graph shown in Fig.Q5(b). (10 Marks)

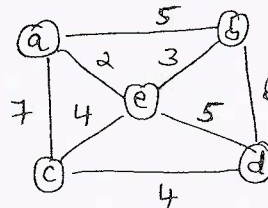


Fig.Q5(b)

OR

- 6 a. Write an algorithm to solve single source shortest path problem. Apply the algorithm to the graph shown in Fig.Q6(a) by considering 'a' as source. (10 Marks)

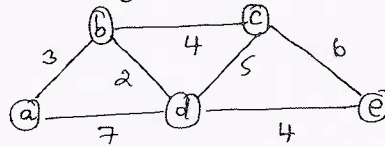


Fig.Q6(a)

- b. Define heap. Write bottom-up heap construction algorithm. Construct heap for the list 1, 8, 6, 5, 3, 7, 4 using bottom-up algorithm and successive key insertion method. (10 Marks)

Module-4

- 7 a. Define transitive closure of a directed graph. Find the transitive closure matrix for the graph whose adjacency matrix is given.

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

(10 Marks)

- b. Find the optimal tour for salesperson using dynamic programming technique. The directed graph is shown in Fig.Q7(b). (10 Marks)

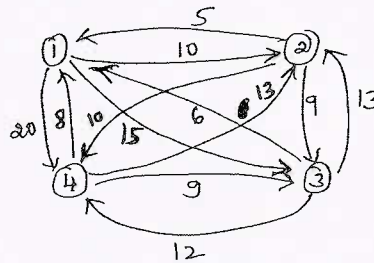


Fig.Q7(b)

OR

- 8 a. Write an algorithm to construct optimal binary search tree for the following data:

Key	A	B	C	D
Probability	0.1	0.2	0.4	0.3

(10 Marks)

- b. Apply the bottom-up dynamic programming algorithm to the following instance of the knapsack problem. Knapsack capacity
- $W = 10$
- .

Item	Weight	Value
1	7	42
2	3	12
3	4	40
4	5	25

(10 Marks)

Module-5

- 9 a. Construct state-space tree for solving four queens problem using backtracking. (06 Marks)
- b. Discuss graph coloring problem. Find different solutions for 4 nodes and all possible 3 coloring problem. (06 Marks)
- c. Write a note on: (i) Non deterministic algorithms. (ii) LC branch and bound solution to solve 0/1 knapsack problem. (08 Marks)

OR

- 10 a. What are the two additional items required by Branch and Bound technique, compared with backtracking. Solve the following assignment problem using branch and bound technique, whose cost matrix for assigning four jobs to four persons are given

$$\begin{bmatrix} 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{bmatrix}$$

(10 Marks)

- b. Discuss the following :
- (i) Subset sum problem
- (ii) NP hard and NP complete classes. (10 Marks)

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17CS44

Fourth Semester B.E. Degree Examination, June/July 2019 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat block diagram explain internal architecture of 8086 microprocessor. (08 Marks)
- b. Explain the following with respect to 8086 microprocessor:
 - (i) Memory segmentation (ii) Flag Register (06 Marks)
- c. Calculate the physical address in following instructions if CS = 4000H, DS = 2000H, SS = 1000H, ES = 3000H, BX = 0022H, BP = 1234H
 - (i) MOV AL, [BX] (ii) MOV CL, [BP] (iii) MOV ES : AX, [BX + 05] (06 Marks)

OR

- 2 a. What is an addressing mode? With example explain different addressing modes of 8086. (08 Marks)
- b. What is stack? Explain the working of PUSH and POP instructions. (06 Marks)
- c. What is an assembler directive? With example explain following assembler directives:
 - (i) assume (ii) org (iii) db (iv) equ (06 Marks)

Module-2

- 3 a. Differentiate between procedure and macro. Write a program using macros that clears the screen, sets the cursor at the centre of screen and display the message "Journey Towards Excellence". (08 Marks)
- b. Explain shift and rotate instructions of 8086. (06 Marks)
- c. Write a program to count number of zeros and ones in a given byte. (06 Marks)

OR

- 4 a. What is an interrupt vector table? Explain the steps a 8086 will take when it responds to an interrupt. (08 Marks)
- b. With example explain the following instructions of 8086.
 - (i) MUL (ii) DAA (iii) CWD (iv) STD (06 Marks)
- c. Write a program to find the value of $x^2 + 2x + 5$, where x is 8 bit input hex number. (06 Marks)

Module-3

- 5 a. What is data integrity? Explain the methods used for data integrity in Ram and ROM. Also find the checksum byte for 34H, 54H, 7FH, 11H, E6H and 99H. (08 Marks)
- b. Explain how signed numbers are represented in 8086. Also explain the significance of overflow flag. (06 Marks)
- c. Explain IN and OUT instructions. Show the design of an output port with an I/O address of 99H using 74LS373. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Differentiate between memory mapped I/O and I/O mapped I/O. Explain the control word format of 8255. (08 Marks)
- b. With example explain any five string manipulation instructions of 8086. (06 Marks)
- c. Write a program to find average of n different temperatures. (06 Marks)

Module-4

- 7 a. Differentiate between RISC and CISC. (06 Marks)
- b. With a neat block diagram explain ARM core data flow model. (06 Marks)
- c. Explain the different operating modes of Arm. Also explain the complete ARM register set. (08 Marks)

OR

- 8 a. With a block diagram explain typical ARM based embedded system. (06 Marks)
- b. With the help of bit layout diagram explain current program status register of ARM. (06 Marks)
- c. Explain the concepts of core Extensions and Pipeline in ARM processor. (08 Marks)

Module-5

- 9 a. With example explain MOV and MVN instructions of ARM. (06 Marks)
- b. Explain the different barrel shifter operations. (06 Marks)
- c. Explain the arithmetic instructions of ARM. (08 Marks)

OR

- 10 a. Explain multiply, branch and load store instructions of ARM. (10 Marks)
- b. With example explain SWAP instruction of ARM. (04 Marks)
- c. Write ARM assembly language program to add two 32 bit numbers. (06 Marks)

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Fourth Semester B.E. Degree Examination, June/July 2019 Software Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define software. Explain essential attributes of good software. (08 Marks)
b. Explain different types of application software's. (06 Marks)
c. Explain Bohem's spiral model. (06 Marks)

OR

- 2 a. Explain a general model of the design process with block diagram. (06 Marks)
b. Explain the structure of requirement document. (08 Marks)
c. Explain requirement elicitation and analysis process. (06 Marks)

Module-2

- 3 a. Explain context models with an example. (08 Marks)
b. Explain : i) Generalization ii) Aggregation. (06 Marks)
c. Draw state diagram for working of microwave oven. (06 Marks)

OR

- 4 a. Explain Rational Unified Process (RUP). (08 Marks)
b. Draw UML state diagram for weather station system. (08 Marks)
c. Discuss in short about open source licensing. (04 Marks)

Module-3

- 5 a. Define testing. Explain interface testing. (08 Marks)
b. Discuss TDD(Test Driven Development) (06 Marks)
c. Explain user testing. (06 Marks)

OR

- 6 a. Define software evolution. Explain software evolution process with block diagram. (08 Marks)
b. Discuss Lehman's laws of program evolution dynamics. (06 Marks)
c. Discuss four strategic options for legacy system management. (06 Marks)

Module-4

- 7 a. Discuss factors affecting software pricing. (10 Marks)
b. Explain project scheduling process. (10 Marks)

OR

- 8 a. Discuss software quality attributes. (08 Marks)
b. Discuss the various inspection checks in program inspection. (06 Marks)
c. Discuss the relationships between internal and external quality attributes. (06 Marks)

Module-5

- 9 a. Explain two ways of coping with change and changing requirements. (10 Marks)
b. Explain extreme programming practices. (10 Marks)

OR

- 10 a. Explain the extreme programming release cycle. (08 Marks)
b. Write short note on pair programming. (06 Marks)
c. Explain SCRUM process. (06 Marks)

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15CS42

Fourth Semester B.E. Degree Examination, June/July 2019 Software Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With the help of block diagram and activity model explain an insulin pump control system. Also comment on the essential high level requirements that this system must meet. (08 Marks)
- b. Explain incremental development process in detail. Also discuss the benefits of this method compared to waterfall model. (08 Marks)

OR

- 2 a. With a neat diagram explain the different stages requirement engineering process. What are its benefits? (08 Marks)
- b. Write a short note on : (04 Marks)
- (i) Interviewing (ii) Ethnography
- c. Explain software requirement document. (04 Marks)

Module-2

- 3 a. Explain the sequence diagram for view patient information. (05 Marks)
- b. Explain use case models with example. (04 Marks)
- c. Explain the state diagram of a microwave oven with neat representation of sketch. (07 Marks)

OR

- 4 a. Describe the process of Rational Unified process in detail. (08 Marks)
- b. Describe the different proposals made about how to identify object classes in object-oriented systems. Also mention different objects identified for weather station. (08 Marks)

Module-3

- 5 a. Explain test driven development. Also mention the benefits of the same. (08 Marks)
- b. With the help of neat diagram, explain the different stages of acceptance testing process. (08 Marks)

OR

- 6 a. Define the different Lehman's laws concerning system change. (08 Marks)
- b. Explain the process of software reengineering. Also mention the advantages of the same. (08 Marks)

Module-4

- 7 a. What is the use of project plan? Describe the different sections of project plan for plan driven development. (08 Marks)
- b. What is the purpose of program inspection? Explain different fault classes and inspection checks done during program inspection. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Give the description of different static software product metrics. (08 Marks)
b. What is software pricing? Describe the different factors affecting software pricing. (08 Marks)

Module-5

- 9 a. Explain the process of prototype development. (08 Marks)
b. With a neat diagram, explain Boehm's spiral model. (08 Marks)

OR

- 10 a. Define any eight extreme programming practices. (08 Marks)
b. Explain the process of scrum. Also mention the different key characteristics of this process. (08 Marks)

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15CS43

Fourth Semester B.E. Degree Examination, June/July 2019
Design and Analysis of Algorithm

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is an algorithm? Summarize the properties of an algorithm. (04 Marks)
- b. Solve the following recurrence relation:
 $x(n) = x(n/2) + n$ for $n > 1$, $x(1) = 1$
 Assume $n = 2^k$ (06 Marks)
- c. Algorithm Test(n)
 // Input : A non negative integer 'n'
 $s \leftarrow 0$
 for $i \leftarrow 1$ to n do
 for $j \leftarrow 1$ to n do
 $s \leftarrow s + i * j$
 return s
 (i) What does this algorithm compute?
 (ii) What is the basic operation?
 (iii) How many times the basic operation executed?
 (iv) What is the efficiency class of this algorithm? (06 Marks)

OR

- 2 a. With neat diagram summarize the steps used to solve a given problem using computer. (06 Marks)
- b. Consider the following algorithm:
 Algorithm s(n)
 {
 If $(n = 1)$ return 1,
 Else return $(s(n - 1) + n.n.n)$
 }
 What does this algorithm? What is the basic operation? How many times the basic operation executed? (04 Marks)
- c. Design a recursive algorithm for computing factorial of a number n . Set up a recurrence relation and find its efficiency. (06 Marks)

Module-2

- 3 a. Discuss how to find maximum and minimum element in an array recursively. Trace the same for the following data set 65, 70, 75, 80, 85, 60, 55, 50, 45. Also derive the worst case complexity. (06 Marks)
- b. What is stable algorithm? Is quick sort stable explain with an example. (04 Marks)
- c. Define decrease and conquer technique and mention all the variations with an example. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.

OR

- 4 a. Design recursive algorithm for mergesort and derive its complexity. (06 Marks)
- b. How would you demonstrate the steps used in Strassen's matrix multiplication. (04 Marks)
- c. What actions would you take to perform topological sort using source removal method explain with an example. (06 Marks)

Module-3

- 5 a. Recall the concept of Greedy technique. (03 Marks)
- b. In the weighted diagram given below Fig.Q5(b), determine the shortest paths from vertex '0' to all other vertices. (07 Marks)

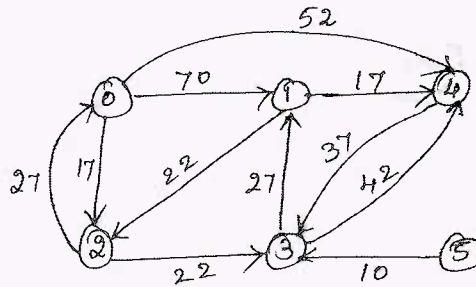


Fig.Q5(b)

- c. How would you solve the following instance of knapsack problem, using greedy algorithm.

Item	1	2	3	4
Weight	4	7	5	3
Profit	40	42	25	12

Knapsack capacity $M = 10$.

(06 Marks)

OR

- 6 a. State job sequencing with deadline. Explain algorithm for job sequencing with dead line. (08 Marks)
- b. Obtain minimum cost spanning tree for the graph given below in Fig.Q6(b), using Prim's algorithm. (08 Marks)

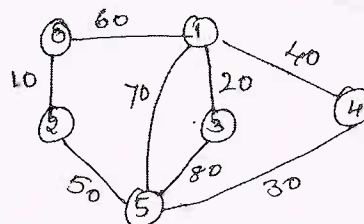


Fig.Q6(b)

Module-4

- 7 a. Using Floyd's Algorithm solve the all pair shortest path problem for the graph whose weight matrix is given below. (06 Marks)

$$\begin{bmatrix} 0 & 10 & \infty & 40 \\ \infty & 0 & \infty & 20 \\ 50 & \infty & 0 & \infty \\ \infty & \infty & 60 & 0 \end{bmatrix}$$

- b. Explain Bellman Ford algorithm. (04 Marks)

c. State travelling sales person problem. Solve the following using dynamic programming.

$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

Starting city = 1

(06 Marks)

OR

- 8 a. How would you define Dynamic programming? With an example illustrate multistage graph for forward approach. (06 Marks)
- b. Using dynamic programming solve the following knapsack $n = 4, M = 5.$
 $(w_1 w_2 w_3 w_4) = (2, 1, 3, 2),$ Profit $(P_1 P_2 P_3 P_4) = (8, 6, 16, 11).$ (06 Marks)
- c. Write Warshall's algorithm. (04 Marks)

Module-5

- 9 a. Explain back tracking method? Draw state space tree to generate solutions to 4-Queen's problem. (06 Marks)
- b. What is branch and bound algorithm? How it is different from backtracking? (04 Marks)
- c. Define the following :
 (i) Class P
 (ii) Class NP
 (iii) NP complete problem. (06 Marks)

OR

- 10 a. Apply backtracking technique to solve the instance of the sum of subset problem :
 $S = \{3, 5, 6, 7\}$ and $d = 15.$ (08 Marks)
- b. Apply branch and bound algorithm to solve the traveling salesman problem for the following graph in Fig.Q10(b). (08 Marks)

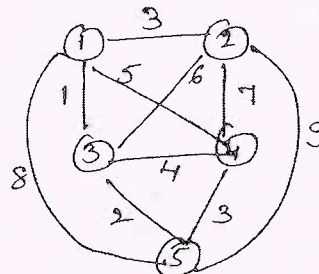


Fig.Q10(b)

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Fourth Semester B.E. Degree Examination, June/July 2019 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat diagram, explain the internal block of 8088/8086 CPU. (10 Marks)
 b. Find errors if there are any and correct the same :
 (i) MOV AL, 1239H (ii) PUSH BL (iii) MOV 12H, BL
 (iv) ADD 15H, 13H (v) MUL AX, BX (vi) ROL AX, 06H (06 Marks)

OR

- 2 a. Define addressing modes. List and explain various addressing modes present in the 8086 microprocessor. (08 Marks)
 b. Assume that DS = 4500, SS = 2000, BX = 2100, SI = 1486, DI = 8500, BP = 7814 and AX = 2512.
 All the values are in HEX. Show the exact physical memory location where AX is stored in each of the following :
 (i) MOV [BX]+20, AX (ii) MOV [SI]+10, AX
 (iii) MOV [DI]+4, AX (iv) MOV [BP]+12, AX (08 Marks)

Module-2

- 3 a. Write an Assembly Language Program (ALP) to calculate the total sum of 6 bytes of data. The decimal data is as follows: 125, 235, 197, 91, 100 and 48. Write suitable comments. (06 Marks)
 b. Explain the following instructions with suitable examples.
 (i) DAA (ii) RCR (iii) RCL (iv) MUL (10 Marks)

OR

- 4 a. Write an assembly language program to convert lower case to upper case for the following sentence. "i aM pROud KanNaDIGA". Use suitable comments. (06 Marks)
 b. Explain the following :
 (i) INT 10H function 06H
 (ii) INT 10H function 02H
 (iii) INT 21H function 09H
 (iv) INT 21H function 01H
 (v) INT 21H function 02H (10 Marks)

Module-3

- 5 a. Show how the computer would represent the following bytes of data:
 (i) -5 (ii) -7 (iii) -34H (iv) -128₍₁₀₎ (06 Marks)
 b. Explain the following with suitable examples:
 (i) XLAT (ii) SCANB (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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- c. Assuming that there is spelling of “VISVESVARAYA” in an electronic dictionary and a student type “VISHVESVARAYYA”. Write an Assembly Language Program that compares these two and display the following messages depending on the result.
- (i) If they are equal “The spelling is correct”
(ii) If they are not equal “Wrong spelling” (05 Marks)

OR

- 6 a. Explain briefly checksum byte and mention the methods being used to check the data integrity in the following storage types: ROM, DRAM, Hard Disks. (06 Marks)
b. Write the 8255 control word format of I/O mode. (04 Marks)
c. Explain IN and OUT instructions with examples. (06 Marks)

Module-4

- 7 a. Write the difference between microprocessors and microcontrollers. (04 Marks)
b. Explain the major design rules to implement the RISC philosophy. (08 Marks)
c. Write a short note on software abstraction layers executing on hardware. (04 Marks)

OR

- 8 a. With a neat diagram, explain registers available in ARM in user mode among with generic program status Register. (06 Marks)
b. What is pipeline in ARM? Illustrate with an example. Show the pipeline stages of ARM7, ARM9 and ARM10. (10 Marks)

Module-5

- 9 a. Explain MOVE instructions in ARM with suitable examples. (08 Marks)
b. Explain the following with examples:
(i) MLA (ii) QADD
(iii) SMULL (iv) LSL (08 Marks)

OR

- 10 a. Write the arithmetic instructions of ARM. (06 Marks)
b. Write the register transfer instructions of ARM (04 Marks)
c. Explain with example forward and backward branch in ARM. (06 Marks)

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15CS45

Fourth Semester B.E. Degree Examination, June/July 2019 Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain with example programs, how console input and console output are performed in C++. (05 Marks)
b. Explain function overloading with an example program. (05 Marks)
c. What are reference variables in C++? Explain with an example program. (06 Marks)

OR

- 2 a. Explain the usage of scope resolution operator with an example program. (08 Marks)
b. Explain parameterized constructor with an example program. (08 Marks)

Module-2

- 3 a. List and explain the java Buzzwords. (08 Marks)
b. Explain various arithmetic operators present in java with examples. (08 Marks)

OR

- 4 a. Explain with examples three uses of break statement in java. (08 Marks)
b. Explain various iteration statements present in java with code snippets. (08 Marks)

Module-3

- 5 a. What is instance variable hiding? How it can be overcome? Explain with an example. (08 Marks)
b. Explain method overriding with an example program. (08 Marks)

OR

- 6 a. Explain the two uses of super keyword with examples. (06 Marks)
b. What is exception? Demonstrate working of try and catch blocks with suitable example program. (05 Marks)
c. Explain the importance of finally clause with an example program. (05 Marks)

Module-4

- 7 a. Explain isAlive() and join() methods with an example program. (08 Marks)
b. Explain how thread can be created by implementing runnable interface with an example program. (08 Marks)

OR

- 8 a. Explain delegation event model used to handle events in Java. (08 Marks)
b. Briefly explain various sources of events. (08 Marks)

Module-5

- 9 a. Define Applet. Explain the skeleton of an Applet in detail. (08 Marks)
b. How can we pass parameters to Applets? Explain with an example program. (08 Marks)

OR

- 10 a. Explain the following: i) JButton ii) JToggleButton iii) JCheckBoxes
iv) Radio Buttons. (08 Marks)
b. Explain JTabbedPane and JScrollPane with example programs. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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15CS46

Fourth Semester B.E. Degree Examination, June/July 2019

Data Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is data communication? With a neat diagram, explain the four basic topology. (06 Marks)
- b. With the help of a diagram, explain the functionalities of each layer of OSI reference model. (10 Marks)

OR

- 2 a. What is the difference between a port address, a logical address and a physical address. (06 Marks)
- b. What is line coding? Represent the sequence "01001110" using NRZ-L, NRZ-I and Manchester scheme. (06 Marks)
- c. Explain digital signal transmission methods. (04 Marks)

Module-2

- 3 a. Explain the PCM technique used for analog to digital conversion. (08 Marks)
- b. Explain Amplitude Shift Keying (ASK) and Phase Shift Keying (PSK) modulation process. (06 Marks)
- c. An analog signal carrier 4 bits per signal element. If 1000 signal elements are sent per second, find the bit rate. (02 Marks)

OR

- 4 a. What is TDM? Explain in detail. (08 Marks)
- b. Explain circuit switched network with an example and also briefly discuss the phases. (04 Marks)
- c. Explain in brief frequency hopping spread spectrum technique. (04 Marks)

Module-3

- 5 a. How does data word and codeword represented in block coding and also explain how can error be detected and corrected by using block coding. (10 Marks)
- b. Given data word 1001 and the divisor 1011:
 - i) Show the generator of the codeword at the sender site
 - ii) Show the checking of codeword at the receiver site (assume no error). (06 Marks)

OR

- 6 a. With a neat diagram, explain Go-Back-N Automatic Repeat Request protocol of noisy channel and explain how flow control and error control is achieved. (10 Marks)
- b. Explain the frame format of HDLC protocol. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. What is channelization? List and explain the channelization protocols. (12 Marks)
b. Explain Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA). (04 Marks)

OR

- 8 a. Describe pure ALOHA and slotted ALOHA. (04 Marks)
b. Explain the different types of addressing mechanism in IEEE 802.11. (08 Marks)
c. Define Bluetooth and explain the architecture of Bluetooth. (04 Marks)

Module-5

- 9 a. Explain in detail cellular telephony. (10 Marks)
b. Write a note on WI MAX. (06 Marks)

OR

- 10 a. Explain satellite network and its categories. (08 Marks)
b. Explain in detail IPV6 packet format. (08 Marks)

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15CS42

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Software Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain briefly software engineering ethics. (04 Marks)
- b. With a suitable block diagram, explain water fall model. (06 Marks)
- c. Explain requirements engineering processes with suitable diagram. (06 Marks)

OR

- 2 a. With the help of neat diagram, explain insulin pump control system. (04 Marks)
- b. With a neat diagram, explain Boehm's spiral model. (08 Marks)
- c. Explain Ethnography in detail. (04 Marks)

Module-2

- 3 a. Draw a context model for Patient Management System. How the interactions are modeled? (06 Marks)
- b. With the help of a neat state diagram, illustrate the working of a microwave oven. (06 Marks)
- c. What is Model Driven Engineering? State the three types of abstract system models produced. (04 Marks)

OR

- 4 a. Illustrate how design models are the bridge between system requirements and the implementation of a system. Draw a sequence diagram describing data collection of weather information system. (05 Marks)
- b. What is design pattern? Explain four elements of design pattern. (05 Marks)
- c. Discuss the implementation issues important in software engineering. (06 Marks)

Module-3

- 5 a. Explain development testing. Explain the three levels of granularity carried out in testing. (04 Marks)
- b. Discuss test driven development and state the benefits of test driven developments. (04 Marks)
- c. What is user testing? Explain six stages of acceptance testing process. (08 Marks)

OR

- 6 a. List and explain the 'Lehman's Law' concern to system change. (06 Marks)
- b. Explain software reengineering process with suitable diagram. State the activities of reengineering process. (06 Marks)
- c. Explain the four strategic options of legacy system management. (04 Marks)

Module-4

- 7 a. List and explain the factors affecting software pricing. (05 Marks)
- b. Explain in detail plan driven development approach to software engineering. (05 Marks)
- c. Explain the COCOMO – II estimation model. (06 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain different types of software standards and mention their importance. (05 Marks)
b. Explain how reviews and inspections are used to check the quality of project delivery. (06 Marks)
c. List and explain the key stages in software component analysis. (05 Marks)

Module-5

- 9 a. Explain the ways of coping with change and reduction of rework cost. (06 Marks)
b. Explain the practices involved in the extreme programming. (10 Marks)

OR

- 10 a. State the principle of agile methods. (05 Marks)
b. Explain plan drive and agile development approach for software development. (05 Marks)
c. Write a note on pair programming. (06 Marks)

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15CS43

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- What is an algorithm? What are the properties of an algorithm? Explain with an example. (04 Marks)
 - Explain the general plan for analyzing the efficiency of a recursive algorithm. Suggest a recursive algorithm to find factorial of a number. Derive its efficiency. (08 Marks)
 - If $t_1(n) \in O(g_1(n))$ and $t_2(n) \in O(g_2(n))$ prove that $t_1(n) + t_2(n) \in O(\max\{g_1(n), g_2(n)\})$. (04 Marks)

OR

- Explain the asymptotic notations with examples. (06 Marks)
 - Distinguish between the two common ways to represent a graph. (04 Marks)
 - Discuss about the important problem types and fundamental data structures. (06 Marks)

Module-2

- Discuss how quick-sort works to sort an array and trace for the following data set. Draw the tree of recursive calls made.

65	70	75	80	85	60	55	50	45
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- Derive the best case complexity of quick sort algorithm. (10 Marks)
 - Briefly explain the Strassen's matrix multiplication. Obtain its time complexity. (06 Marks)

OR

- Explain the concept of divide and conquer. Design an algorithm for merge sort and derive its time complexity. (10 Marks)
 - What are the three major variations of decrease and conquer technique? Explain with an example for each. (06 Marks)

1 of 3

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Explain the concept of greedy technique for Prim's algorithm. Obtain a minimum cost spanning tree for the graph shown in Fig.Q5(a). (08 Marks)

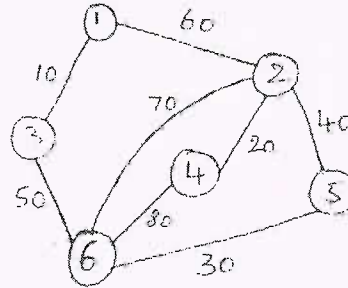


Fig.Q5(a)

- b. Solve the below instance of the single source shortest path problem with vertex 6 as the source. With the help of a suitable algorithm. (08 Marks)

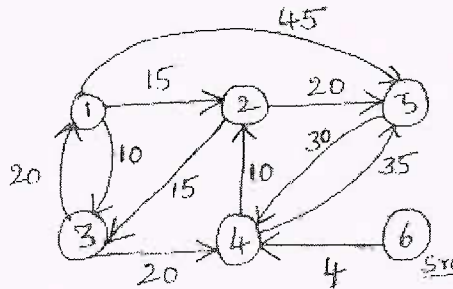


Fig.Q5(b)

OR

- 6 a. What are Huffman trees? Explain. Construct a Huffman code for the following data :

Character	A	B	C	D	E	-
Probability	0.5	0.35	0.5	0.1	0.4	0.2

- b. Encode DAD_CBE using Huffman encoding. (08 Marks)
- b. Explain transform and conquer technique. Sort the below list using Heap sort : 3, 2, 4, 1, 6, 5. (08 Marks)

Module-4

- 7 a. Define transitive closure of a graph. Write Warshall's algorithm to compute transitive closure of a directed graph. Apply the same on the graph defined by the following adjacency matrix :

$$R = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

(08 Marks)

- b. Using Dynamic programming, solve the below instance of knapsack problem. (08 Marks)

Item	Weight	Value
1	2	12
2	1	10
3	3	20
4	2	15

Capacity $w = 5$

OR

- 8 a. Obtain an optimal binary search tree for the following four-key set. (08 Marks)

Key	A	B	C	D
Probability	0.1	0.2	0.4	0.3

- b. Solve the following travelling sales person problem represented as a graph shown in Fig.Q8(b), using dynamic programming. (08 Marks)

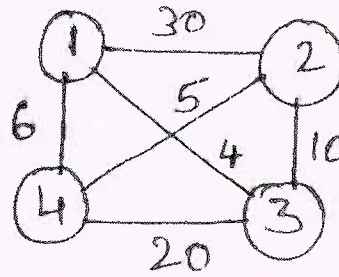


Fig.Q8(b)

Module-5

- 9 a. What is the central principle of backtracking? Apply backtracking to solve the below instance of sum of subset problem
 $S = \{5, 10, 12, 13, 15, 18\}$ $d = 30$. (08 Marks)
- b. Solve the below instance of assignment problem using branch and bound algorithm.

$$C = \begin{matrix} & \begin{matrix} \text{Job}_1 & \text{Job}_2 & \text{Job}_3 & \text{Job}_4 \end{matrix} \\ \begin{matrix} \text{Person a} \\ \text{Person b} \\ \text{Person c} \\ \text{Person d} \end{matrix} & \begin{pmatrix} 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{pmatrix} \end{matrix}$$

(08 Marks)

OR

- 10 a. Draw the state-space tree to generate solutions to 4-Queen's problem. (04 Marks)
- b. Apply backtracking to the problem of finding a Hamiltonian circuit in the graph shown below : (04 Marks)

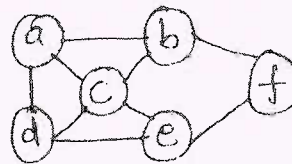


Fig.Q10(a)

- c. Define the following :
- Class P
 - Class NP
 - NP complete problem
 - NP hard problem.

(08 Marks)

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Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing
ONE full question from each module.

Module-1

- 1 a. Explain with neat block diagram, the architecture of 8086 microprocessor. (08 Marks)
b. What are Addressing Modes? Discuss its types with suitable examples. (08 Marks)

OR

- 2 a. Develop an assembly language program to calculate the sum of 5 bytes of data. (05 Marks)
b. With a neat block diagram, explain the three steps to create executable assembly language program. (06 Marks)
c. What are assembler directives? Discuss any three directives with examples. (05 Marks)

Module-2

- 3 a. Discuss shift and rotate instruction of 8086 microprocessor with examples. (08 Marks)
b. Explain with suitable examples the logical instructions of 8086 microprocessor. (04 Marks)
c. Discuss multiplication (MUL) and division (DIV) instructions of 8086 microprocessor. (04 Marks)

OR

- 4 a. What are interrupts? Discuss interrupt vector table with diagram for 8086 microprocessor. (06 Marks)
b. Write an assembly language program for 8086 that :
i) Clears the screen
ii) Sets the cursor at the centre of screen. (05 Marks)
c. Develop an assembly language program for 8086 to convert Binary Coded Decimal (BCD) to ASCII. (05 Marks)

Module-3

- 5 a. Explain the string instructions (MOVS, LODS, STOS, CMPS and SCAS) with suitable examples. (08 Marks)
b. Discuss the sign extension of 8 bit and 16 bit operands [CBW and CWD] in 8086 with suitable examples. (08 Marks)

OR

- 6 a. Discuss 8086 input/output (IN and OUT) instructions with examples. (04 Marks)
b. Explain 8255 and its control word format with diagrams. (08 Marks)
c. Explain the features of 8255 PPI. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Discuss the processor modes of CPSR with respect to ARM processor. (06 Marks)
b. Write the comparison between microprocessor and microcontrollers. (04 Marks)
c. Explain with neat block diagram the ARM based embedded device microcontroller. (06 Marks)

OR

- 8 a. Discuss the following with diagrams :
i) Von Neumann architecture with cache
ii) Harvard architecture with TCM. (08 Marks)
b. Explain the pipeline mechanism in (Advanced RISC Machine)ARM processor. (08 Marks)

Module-5

- 9 a. Discuss the comparison instructions with examples with respect to ARM processor. (05 Marks)
b. Explain the Barrel shifter operation in ARM processor with diagram. (06 Marks)
c. Explain the arithmetic instructions with examples with respect to ARM process. (05 Marks)

OR

- 10 a. Explain briefly co-processor instructions of ARM processor. (04 Marks)
b. Discuss the load store instructions with respect to :
i) Single Register Transfer
ii) Multiple Register Transfer. (07 Marks)
c. Write a short note on Swap instructions with examples with respect to ARM processor. (05 Marks)

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Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write the differences between procedure oriented program and object oriented program. (04 Marks)
- b. List and explain any four features of object oriented program. (05 Marks)
- c. What is function overloading? Write a C++ program to define three overloaded functions to find the sum of two integers, sum of two floating point numbers and sum of three integers. (07 Marks)

OR

- 2 a. Define a Student class with following measures:
Data members: RollNo., Name, averagemarks
Member function: to read the data, to print the data, write a C++ program to read the data of 10 students and print the 10 students information. (05 Marks)
- b. Define a friend function. Illustrate with an example. (05 Marks)
- c. What is constructor? Mention its types. Explain parameterized constructor with an example. (06 Marks)

Module-2

- 3 a. List and explain the java buzzwords. (08 Marks)
- b. class Example {
public static void main (String args[]) {
int a;
for (a = 0; a < 3; a++)
{ int b = -1;
System.out.println (" " + b);
b = 50;
System.out.println (" " + b);
}
}
}
What is the output of the above code? If you insert another 'int b' outside the for loop, what is the output. (04 Marks)
- c. With an example, explain in working of >> and >>> (unsigned right shift). (04 Marks)

OR

- 4 a. Define bytecode. How does it help java program(s) achieve portability? (05 Marks)
- b. Write a java program to sum only the first five elements of the array {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} using "for each" version of the for loop. (06 Marks)
- c. Define type casting. Explain with an example. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Define inheritance. Explain multilevel hierarchy with an example program. (05 Marks)
 b. Describe the various levels of access protections available for packages and their implications. (07 Marks)
 c. Distinguish between method overloading and overriding in Java, with suitable example. (04 Marks)

OR

- 6 a. Define exception. Explain exception handling mechanism with an example. (08 Marks)
 b. Discuss the following terms with example: i) super ii) final (08 Marks)

Module-4

- 7 a. What is thread? Explain two ways of creating a thread in JAVA with example. (08 Marks)
 b. What is the need of synchronization? Explain with an example how synchronization is implemented in JAVA. (08 Marks)

OR

- 8 a. Explain the delegation event model used to handle events in JAVA. What are events, event listener and event sources? (06 Marks)
 b. With the syntax, explain the use of isAlive() and join() methods. (04 Marks)
 c. Explain Adapter class and Inner classes with example. (06 Marks)

Module-5

- 9 a. What is an Applet? Explain the skeleton of an Applet. Enlist applet tags. (08 Marks)
 b. Write a program using an Applet which will Print "key pressed" on the status window when you press the key, "key released" on the status window when you release the key and when you type the characters it should print "Hello" at coordinates (50, 50) on Applet. (08 Marks)

OR

- 10 a. Describe the two key features of swings. (04 Marks)
 b. Explain the following with an example for each and syntax:
 i) JLabel
 ii) Jtextfield
 iii) JButton
 iv) JComboBox (12 Marks)

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15CS46

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Data Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Data Communication. Explain the Fundamental components of a data communication system. With the neat diagram, explain components of data communication. (06 Marks)
- b. List out the functionalities of physical layer, data link layer, network layer, explain in brief. (04 Marks)
- c. Define Transmission impairment. Explain different causes of transmission impairment during signal transmission. (06 Marks)

OR

- 2 a. Explain digital signal transmission methods. Explain line coding. (06 Marks)
- b. Draw the line code for the sequence 01001110 using NRZ, NRZ-L, NRZ-I, RZ, AMI. (07 Marks)
- c. Define Through put. A network with a bandwidth of 10mbps can pass only an average of 12,000 frames per minute. With each frame carrying an average of 10,000 bits. What is the throughput of this network? (03 Marks)

Module-2

- 3 a. Explain PCM and quantization process with steps. (08 Marks)
- b. What is Spread Spectrum? Explain FHSS with suitable diagram. (08 Marks)

OR

- 4 a. What is Multiplexing? Define Synchronous TDM, with data rate management – strategies. (07 Marks)
- b. Compute the following, if the data rate for each input connection is 1Kbps. If 1 bit at a time is multiplexed, what is the duration of i) Each input slot ii) Each output slot iii) Each frame. (03 Marks)
- c. Explain how message can be sent from one system to another using datagram approach and calculate the total delay with appropriate diagram. (06 Marks)

Module-3

- 5 a. Explain Error detection using block coding. (06 Marks)
- b. Identify the code word using CRC given data word 1001 and generator is 1011. (04 Marks)
- c. Explain different frame types in HDLC. (06 Marks)

OR

- 6 a. What is Internet checksum? If a sender needs to send four data items 7, 11, 12, 0, 6 answer the following : (06 Marks)
- i) Find the checksum at the sender site.
- ii) Find the checksum at the receiver site if there is no error.
- b. Explain stop and wait protocol with appropriate diagram. (04 Marks)
- c. Explain the frame format and transition phases of point to point protocol. (06 Marks)

Module-4

- 7 a. What is Channelization? List and explain the channelization protocols. (06 Marks)
b. A slotted ALOHA network transmit 200 bit frames using a shared channel with 200 K bits/sec bandwidth. Find the throughput if the system produces. (06 Marks)
i) 1000 Frames per second ii) 500 Frames per second iii) 250 Frames per second.
c. Describe Gigabit Ethernet. (04 Marks)

OR

- 8 a. Describe Pure ALOHA and Slotted ALOHA. (04 Marks)
b. Explain briefly controlled access method. (06 Marks)
c. Define Bluetooth and its architecture. (06 Marks)

Module-5

- 9 a. Write a short note on Satellite networks. (04 Marks)
b. Explain the Operation of cellular telephony. (06 Marks)
c. Explain Transition from IPV4 to IPV6. (06 Marks)

OR

- 10 a. Explain the working of mobile Ip with phases. (08 Marks)
b. Explain IP datagram header format, with neat diagram and give the description of each field. (08 Marks)

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15CS32

Third Semester B.E. Degree Examination, June/July 2017 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain with help of a circuit diagram and characteristic curves working of N-channel DE MOSFET. (12 Marks)
- b. List and explain any one application of FET and its working with circuit Diagram. (04 Marks)

OR

- 2 a. Explain the performance parameters of operational amplifier. (08 Marks)
- b. Mention and explain the working of any two applications of operational amplifier. (08 Marks)

Module-2

- 3 a. What is a logical gate? Realize $((A + B) \cdot C)D$ using only NAND Gates. (04 Marks)
- b. Describe positive and Negative logic. List the equivalences between them. (04 Marks)
- c. Find the minimal SOP (sum of product) for the following Boolean functions using K-map
- i) $f(a, b, c, d) = \sum m(6, 7, 9, 10, 13) + d(1, 4, 5, 11)$
- ii) $f(a, b, c, d) = \pi M(1, 2, 3, 4, 10) + d(0, 15)$ (08 Marks)

OR

- 4 a. Using Quine -- McClusky Method simplify the following Boolean equation.
 $f(a, b, c, d) = \sum m(0, 1, 2, 3, 10, 11, 12, 13, 14, 15)$. (10 Marks)
- b. Define Hazard. Explain Different Types of Hazards. (06 Marks)

Module-3

- 5 a. What is multiplexer? Design a 32 to 1 multiplexer (MUX) using two 16 to 1 MUX and one 2 to 1 MUX. (04 Marks)
- b. Show How using 3 to 8 Decoder and multi input OR gates, following Boolean Expressions can be realized simultaneously
 $F_1(a, b, c) = \sum m(0, 4, 6)$, $F_2(a, b, c) = \sum m(0, 5)$, $F_3(a, b, c) = \sum m(1, 2, 3, 7)$ (05 Marks)
- c. Design 7 segment Decoder using PLA. (07 Marks)

OR

- 6 a. Implement the Boolean function expressed by SOP $f(a, b, c, d) = \sum m(1, 2, 5, 6, 9, 12)$ using 8 : 1 MUX. (04 Marks)
- b. What is magnitude comparator? Design and explain 2 bit magnitude comparator. (08 Marks)
- c. Differentiate between combinational and sequential circuit. (04 Marks)

Module-4

- 7 a. With a neat logic diagrams and truth table. Explain the working of JK master slave Flip-Flop along with its implementation using NAND Gates. (10 Marks)
- b. Derive the characteristic equation for SR, D and JK Flip-Flop. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8=50$, will be treated as malpractice.

OR

- 8 a. Using Negative Edge triggered D-Flip Flop. Draw a Logic diagram of 4 bit serial in serial out (SISO) Register. Draw the waveform to shift Binary number 1010 into this register. (06 Marks)
- b. Explain with neat diagram How shift Register can be applied for serial addition. (07 Marks)
- c. Differentiate between synchronous and Asynchronous counter. (03 Marks)

Module-5

- 9 a. Design Asynchronous counter for the sequences $0 \rightarrow 4 \rightarrow 1 \rightarrow 2 \rightarrow 6 \rightarrow 0 \rightarrow 4$. Using S. R Flip-Flop. (12 Marks)
- b. With neat diagram. Explain Digital Clock. (04 Marks)

OR

- 10 a. Explain 2 bit simultaneous A/D converter. (10 Marks)
- b. What is Binary Ladder? Explain the Binary Ladder with Digital input of 1000. (06 Marks)

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10CS32

Third Semester B.E. Degree Examination, June/July 2017

Electronic Circuits

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. What is UJT? With the help of relevant diagram, explain the construction and operational principle of a UJT. (08 Marks)
- b. For the fixed biased circuit of Fig.Q1(b), determine the operating point (given that $\beta = 100$, $V_{BE} = 0.7 V$). Also draw the load line for the circuit.

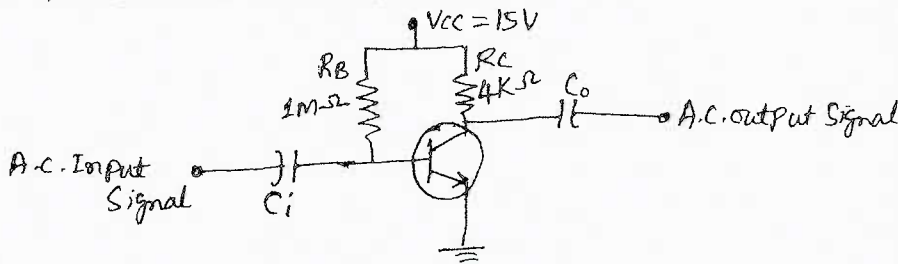


Fig.Q1(b)

(07 Marks)

- c. Explain thermal runaway as referred to transistor. (05 Marks)
- 2 a. With the help of neat diagrams, explain the construction and characteristics of N-channel depletion MOSFET. (10 Marks)
- b. Fig.Q2(b) shows a biasing configuration using DE-MOSFET, given that the saturation drain current is 8 mA and the pinch off voltage is $-2V$. Determine the value of the gate source voltage, drain current and drain source voltage.

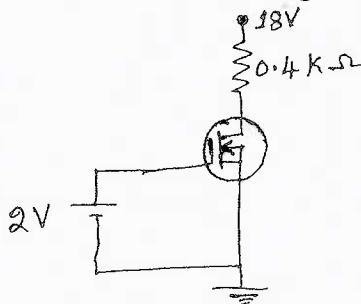


Fig.Q2(b)

(05 Marks)

- c. Explain the operation of CMOS inverter. (05 Marks)
- 3 a. Define the following terms:
 - i) Responsivity
 - ii) Noise equivalent power (NEP)
 - iii) Detectivity and Dee star
 - iv) Quantum efficiency
 - v) Response time
 (05 Marks)
- b. What is a photo transistor? Draw the schematic symbol of a photo transistor. Explain its V-I characteristics. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- c. A photodiode has a noise current of 1 fA, responsivity figure of 0.5 A/W, active area of 1 mm^2 and rise time of 3.5 ns. Determine its:
- NEP
 - Detectivity
 - D^*
 - Quantum efficiency at 850 nm. (05 Marks)
- d. What are opto couplers? Explain the important characteristic parameters of opto couplers. (05 Marks)
- 4 a. Draw the generalized h-parameter model of a transistor based amplifier and derive the expression for:
- Current gain
 - Input impedance
 - Voltage gain
 - Output admittance (10 Marks)
- b. With neat figure, explain the operation of Darlington Amplifier. (05 Marks)
- c. What are cascade amplifiers? What are the advantages of cascade amplifiers? (05 Marks)

PART – B

- 5 a. Explain classification of large signal amplifiers as class A, class B, class C and class AB amplifiers. (04 Marks)
- b. What are the advantages of negative feedback? (04 Marks)
- c. Derive the relevant expressions to prove that input resistance increases and output resistance reduces in case of a voltage series feedback. (08 Marks)
- d. The total harmonic distortion of an amplifier reduces from 10% to 1% on introduction of 10% negative feedback. Determine the open loop and closed loop gain values. (04 Marks)
- 6 a. Explain the Barkhausen criterion as referred to oscillators. (05 Marks)
- b. With a neat diagram, explain the operation of voltage controlled Hartley oscillator. (07 Marks)
- c. With a neat circuit and relevant waveforms, explain the operation of monostable multi-vibrator using IC 555 timer. (08 Marks)
- 7 a. Name the constituent parts of a basic linearly regulated power supply. Briefly describe the function of each of the constituent parts. (03 Marks)
- b. Define: i) Load regulation; ii) Line regulation, iii) Ripple rejection factor with reference to regulated power supplies. (04 Marks)
- c. With neat figure, explain the working of a Buck Regulator. (08 Marks)
- d. Refer to the three terminal regulator circuit of Fig.Q7(d). Determine: (i) Load current, (ii) Current through LM7812, (iii) Current through external transistor, (iv) Power dissipated in LM7812. Take $V_{BE(Q_1)} = 0.7 \text{ V}$.

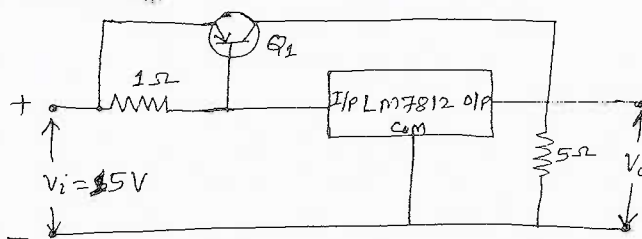


Fig.Q7(d) (05 Marks)

- 8 a. Define the following: i) CMRR, ii) PSRR, iii) Slew rate, iv) Band width, v) Open loop gain of an op-amp. (05 Marks)
- b. With a neat figure, explain the operation of a peak detector. (07 Marks)
- c. With a neat figure and relevant waveforms, explain the working of relaxation oscillator circuit using op-amp. (08 Marks)

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15CS33

Third Semester B.E. Degree Examination, June/July 2017

Data Structure and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write a C program with an appropriate structure definition and variable declaration to read and display information about 5 employees using nested structures. Consider the following fields like Ename, Empid, DOJ (Date, Month, Year) and Salary (Basic, DA, HRA). (08 Marks)
- b. Give ADT of sparse matrix and show with a suitable example sparse matrix representation storing as triples. Give a sample transpose function to transpose sparse matrix. (08 Marks)

OR

- 2 a. What is a polynomial? What is the degree of the polynomial? Write a function to add two polynomials. (08 Marks)
- b. List and explain the functions supported by C for dynamic memory allocation. (04 Marks)
- c. Write a C program to concatenate Fname and Lname of a person without using any library function. (04 Marks)

Module-2

- 3 a. Define stack and write the ADT of stack. Implement push and pop functions for stack using arrays with StackFull and StackEmpty conditions. (08 Marks)
- b. What is an input restricted double ended queue? Implement the same with the supporting functions. (08 Marks)

OR

- 4 a. Write the postfix form of the following expression using stack:
 i) $(a + b) * d + e / (f + a * d) + c$ ii) $((a/(b - c + d)) * (e - a) * c)$ (04 Marks)
- b. Write a function to evaluate a postfix expression and trace the same for the expression $a/b/c - d e * + a c *$ where $a = 6, b = 3, c = 1, d = 2, e = 4$. (06 Marks)
- c. Explain with a suitable example, how would you implement circular queue using dynamically allocated arrays. (06 Marks)

Module-3

- 5 a. Give the node structure to create a linked list of integers and write C functions to perform the following:
 i) Create a three node list with data 10, 20 and 30.
 ii) Insert a node with the data value 15 in between the nodes having the data values 10 and 20.
 iii) Delete the node whose data is 20.
 iv) Display the resulting singly linked list. (10 Marks)
- b. Write a node structure for linked representation of polynomial. Explain the algorithm to add two polynomials represented using linked list. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Write C functions to perform the following:
- Reversing a singly linked list.
 - Concatenating singly linked list.
 - Finding the length of the list. (06 Marks)
- b. List out the difference between the doubly linked list and singly linked list. Illustrate with example the following operations on a doubly linked list:
- Inserting a node at the beginning.
 - Inserting at the intermediate position.
 - Deletion of a node with a given value.
 - Search a key element. (10 Marks)

Module-4

- 7 a. Define binary trees. Explain the following with example:
- Complete binary tree
 - Skewed binary tree
 - Almost complete binary tree
 - Degree of a binary tree. (09 Marks)
- b. For the given data, draw a binary search tree and show the array and linked representation of the same 100, 85, 45, 55, 110, 20, 70, 65. (07 Marks)

OR

- 8 a. Draw a binary tree for the following expression $3 + 4 * (7 - 6) / 4 + 3$. Traverse the above generated tree using inorder, preorder and postorder. Also write a function in C for each one. (09 Marks)
- b. What is the advantage of threaded binary tree over binary tree? Explain the construction of threaded binary tree for 10, 20, 30, 40, 50. (07 Marks)

Module-5

- 9 a. Define graph. Write the difference between graph and trees. For the given graph, show the adjacency matrix and adjacency list representation of the graph. [Refer Fig.Q9(a)]

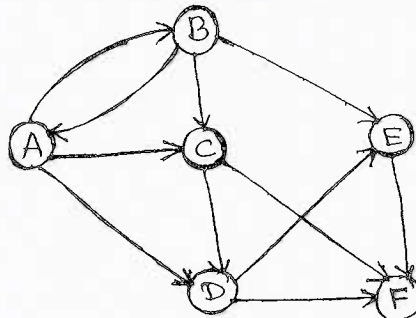


Fig.Q9(a)

(08 Marks)

- b. What are the methods used for traversing a graph? Explain any one with example. (08 Marks)

OR

- 10 a. Write a C function for insertion sort. Sort the following list using insertion sort: 50, 30, 10, 70, 40, 20, 60. (08 Marks)
- b. What is collision? What are the methods to resolve collision? Explain linear probing with an example. (08 Marks)

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CBCS Scheme

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15CS33

Third Semester B.E. Degree Examination, June/July 2017 Data Structure and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write a C program with an appropriate structure definition and variable declaration to read and display information about 5 employees using nested structures. Consider the following fields like Ename, Empid, DOJ (Date, Month, Year) and Salary (Basic, DA, HRA). (08 Marks)
- b. Give ADT of sparse matrix and show with a suitable example sparse matrix representation storing as triples. Give a sample transpose function to transpose sparse matrix. (08 Marks)

OR

- 2 a. What is a polynomial? What is the degree of the polynomial? Write a function to add two polynomials. (08 Marks)
- b. List and explain the functions supported by C for dynamic memory allocation. (04 Marks)
- c. Write a C program to concatenate Fname and Lname of a person without using any library function. (04 Marks)

Module-2

- 3 a. Define stack and write the ADT of stack. Implement push and pop functions for stack using arrays with StackFull and StackEmpty conditions. (08 Marks)
- b. What is an input restricted double ended queue? Implement the same with the supporting functions. (08 Marks)

OR

- 4 a. Write the postfix form of the following expression using stack:
i) $(a + b) * d + e / (f + a * d) + c$ ii) $((a/(b - c + d)) * (e - a) * c)$ (04 Marks)
- b. Write a function to evaluate a postfix expression and trace the same for the expression $a b/c - d e * + a c *$ where $a = 6, b = 3, c = 1, d = 2, e = 4$. (06 Marks)
- c. Explain with a suitable example, how would you implement circular queue using dynamically allocated arrays. (06 Marks)

Module-3

- 5 a. Give the node structure to create a linked list of integers and write C functions to perform the following:
i) Create a three node list with data 10, 20 and 30.
ii) Insert a node with the data value 15 in between the nodes having the data values 10 and 20.
iii) Delete the node whose data is 20.
iv) Display the resulting singly linked list. (10 Marks)
- b. Write a node structure for linked representation of polynomial. Explain the algorithm to add two polynomials represented using linked list. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.

OR

- 6 a. Write C functions to perform the following:
- Reversing a singly linked list.
 - Concatenating singly linked list.
 - Finding the length of the list. (06 Marks)
- b. List out the difference between the doubly linked list and singly linked list. Illustrate with example the following operations on a doubly linked list:
- Inserting a node at the beginning.
 - Inserting at the intermediate position.
 - Deletion of a node with a given value.
 - Search a key element. (10 Marks)

Module-4

- 7 a. Define binary trees. Explain the following with example:
- Complete binary tree
 - Skewed binary tree
 - Almost complete binary tree
 - Degree of a binary tree. (09 Marks)
- b. For the given data, draw a binary search tree and show the array and linked representation of the same 100, 85, 45, 55, 110, 20, 70, 65. (07 Marks)

OR

- 8 a. Draw a binary tree for the following expression $3 + 4 * (7 - 6) / 4 + 3$. Traverse the above generated tree using inorder, preorder and postorder. Also write a function in C for each one. (09 Marks)
- b. What is the advantage of threaded binary tree over binary tree? Explain the construction of threaded binary tree for 10, 20, 30, 40, 50. (07 Marks)

Module-5

- 9 a. Define graph. Write the difference between graph and trees. For the given graph, show the adjacency matrix and adjacency list representation of the graph. [Refer Fig.Q9(a)]

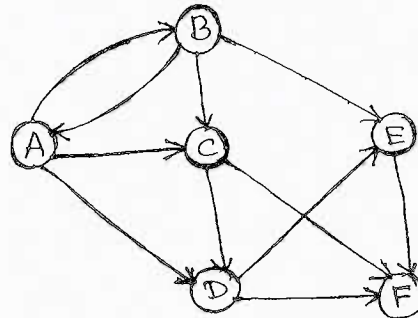


Fig.Q9(a)

- b. What are the methods used for traversing a graph? Explain any one with example. (08 Marks)

OR

- 10 a. Write a C function for insertion sort. Sort the following list using insertion sort: 50, 30, 10, 70, 40, 20, 60. (08 Marks)
- b. What is collision? What are the methods to resolve collision? Explain linear probing with an example. (08 Marks)

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15CS34

Third Semester B.E. Degree Examination, June/July 2017

Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. With a neat block diagram discuss the basic operational concept of a computer. (06 Marks)
b. Explain the methods to improve the performance of computer. (04 Marks)
c. Explain Big-Endian, little Endian and assignment byte addressability. (06 Marks)

OR

- 2 a. What are addressing modes? Explain the different 4 types addressing modes with example. (08 Marks)
b. Write the use of Rotate and shift instruction with example. (04 Marks)
c. What is stack and queue? Write the line of code to implement the same. (04 Marks)

Module-2

- 3 a. Define bus arbitration? Explain detail any one approach of bus arbitration. (08 Marks)
b. What are priority interrupts? Explain any one interrupt priority scheme. (04 Marks)
c. Write a note on register in DMA interface. (04 Marks)

OR

- 4 a. With a block diagram explain how the printer interfaced to processor. (08 Marks)
b. Explain the following with respect to U.S.B
i) U.S.B Architecture
ii) U.S.B protocols. (08 Marks)

Module-3

- 5 a. Define :
i) Memory Latency
ii) Memory bandwidth
iii) Hit-rate
iv) Miss-penalty. (04 Marks)
b. With a neat diagram explain the internal organization of a 2M×8 dynamic memory chip. (06 Marks)
c. Explain Associative mapping technique and set Associative mapping technique. (06 Marks)

OR

- 6 a. What is virtual memory? With a diagram explain how virtual memory address is translated. (08 Marks)
b. Write a note on :
i) Magnetic tape system
ii) Flash memory. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Perform following operations on the 5-bit signed numbers using 2's complement representation system. Also indicate whether overflow has occurred.
i) $(-9) + (-7)$ ii) $(+7) - (-8)$. (04 Marks)
- b. Explain with a neat block diagram, 4 bit carry lookahead adder. (05 Marks)
- c. Explain the concept of carry save addition for the multiplication operation, $M \times Q = P$ for 4-bit operands with diagram and suitable example. (07 Marks)

OR

- 8 a. Multiply the following signed 2's complement numbers using Booth's algorithm
multiplicand = $(010111)_2$, multiplier = $(110110)_2$. (05 Marks)
- b. Perform division operation on the following unsigned numbers using the restoring method.
Dividend = $(10101)_2$ Divisor = $(00100)_2$, (05 Marks)
- c. With a neat diagram, explain the floating point addition/subtraction unit. (06 Marks)

Module-5

- 9 a. Draw and explain multiple bus organization of CPU. And write the control sequence for the instruction Add R4, R5, R6 for the multiple bus organization. (08 Marks)
- b. Explain with neat diagram, micro-programmed control method for design of control unit and write the micro-routine for the instruction Branch < 0. (08 Marks)

OR

- 10 a. With block diagram, explain the working of microwave oven in an embedded system. (08 Marks)
- b. With block diagram, explain parallel I/O interface. (08 Marks)

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10CS35

Third Semester B.E. Degree Examination, June/July 2017

Data Structures with C

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. List and define the criteria's that an algorithm must satisfy. Write an algorithm and its C code for selection sort. (08 Marks)
 - b. Define dynamic memory allocation. What are the benefits of dynamic memory allocation? Explain the memory allocation functions with example. (07 Marks)
 - c. Find the space complexity and time complexity for the following function. Assume 32-bit machine.


```
float rsum (float list [ ], int n)
{
    if (n)
        return rsum (list, n - 1) + list[n - 1];
    return 0;
}
```

(05 Marks)
- 2
 - a. Develop a structure to represent the planets in the solar system. Each planet has fields for the planet's name, its distance from sun, and the number of moons it has. Initialize items in each of the fields for the planets: Earth and Venus. (04 Marks)
 - b. Write a C program to add two polynomials. (10 Marks)
 - c. Give the ADT of sparse matrix. Write a function to transpose a sparsematrix. (06 Marks)
- 3
 - a. Define queue. List and define the different types of queues. Write the implementation of primitive operations of linear queue. (08 Marks)
 - b. Write a C program to evaluate a given postfix expression. (08 Marks)
 - c. Convert the following infix expression into postfix and prefix expression:
 $(a + b) * d + e / (f + a * d) + c$ (04 Marks)
- 4
 - a. Write a C program to implement a stack using linked list. (06 Marks)
 - b. Write a function for inverting a simply linked list and a function for finding the length of a circular linked list. (06 Marks)
 - c. Give a node structure for sparse matrices. Write the linked representation for the following sparse matrix.

$$\begin{bmatrix} 2 & 0 & 0 & 0 \\ 4 & 0 & 0 & 3 \\ 0 & 0 & 0 & 0 \\ 8 & 0 & 0 & 1 \\ 0 & 0 & 6 & 0 \end{bmatrix}$$
(08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

PART – B

- 5 a. List and explain the different types of representation of trees with an example. (06 Marks)
b. Write the C implementation of inorder, preorder and postorder traversals. Illustrate with an example. (08 Marks)
c. Suppose that we have the following key values 7, 16, 49, 82, 5, 31, 6, 2, 44. Write out the max heap and min heap after each value is inserted into the heap. (06 Marks)
- 6 a. With an example, explain selection trees. (06 Marks)
b. With an example explain weighting rule for union and collapsing rule for find operation. (08 Marks)
c. Construct a binary search tree by using the following inorder and preorder traversals.
Inorder : BCAEDGHI
Preorder : ABCDEFGHI (06 Marks)
- 7 a. Briefly explain the height-biased leftiest trees and weight-biased leftiest trees with example. (08 Marks)
b. What is binomial heap? Explain the steps involved in the deletion of min element from a binomial heap. (08 Marks)
c. List and define the different types of pairing heaps. Explain meld operation of pairing heaps with an example. (04 Marks)
- 8 a. What is an AVL tree? Write the algorithm to insert an item into AVL tree. Explain LR rotation with an example. (10 Marks)
b. Write short notes on the following:
i) Red-black trees
ii) Splay trees (10 Marks)

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15CS36

Third Semester B.E. Degree Examination, June/July 2017

Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define the following with an example for each
- Proposition
 - Tautology
 - Contradiction
 - Dual of statement. (06 Marks)
- b. Establish the validity of the following argument using rules of inference. If the band could not play rock music or the refreshments were not served on time, then the new year party could have been cancelled and Alica would have been angry. If the party were cancelled, then refunds would have to be made. No refunds were made, therefore the band could play rock music. (05 Marks)
- c. Determine the truth value of the following statements if the universe comprises all nonzero integers :
- $\exists x \exists y [xy = 2]$
 - $\exists x \forall y [xy = 2]$
 - $\forall x \exists y [xy = 2]$
 - $\exists x \exists y [(3x + y = 8) \wedge (2x - y) = 7]$
 - $\exists x \exists y [(4x + 2y = 3) \wedge (x - y = 1)]$ (05 Marks)

OR

- 2 a. Find the possible truth values for p, q and r if
- $p \rightarrow (q \vee r) - \text{FALSE}$
 - $p \wedge (q \rightarrow r) - \text{TRUE}$. (05 Marks)
- b. Show that $(p \wedge (p \rightarrow q)) \rightarrow q$ is independent of its components. (06 Marks)
- c. Give a direct proof for each of the following :
- For all integers k and ℓ , if k and ℓ are both even, then $k + \ell$ is even
 - For all integers k and ℓ , if k and ℓ are both even, then $k * \ell$ is even. (05 Marks)

Module-2

- 3 a. Prove by mathematical induction, for every positive integer 8 divides $5^n + 2 \cdot 3^{n-1} + 1$. (06 Marks)
- b. Assuming PASCAL language is case insensitive, an identifier consists of a single letter followed by upto seven symbols which may be letters or digits (26 letters, 10 digits). There are 36 reserved words. How many distinct identifiers are possible in this version of PASCAL? (05 Marks)
- c. Find the coefficient of $a^2 b^3 c^2 d^5$ in the expansion of $(a + 2b - 3c + 2d + 5)^{16}$. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.

OR

- 4 a. Prove that $4n < (n^2 - 7)$ for all positive integers $n \geq 6$. (05 Marks)
- b. Lucas numbers are defined recursively as $L_0 = 2$, $L_1 = 1$ and $L_n = L_{n-1} + L_{n-2}$ for $n \geq 2$. If F_i^s are fibonacci numbers and L_i^s are the Lucas numbers, prove that $L_n = F_{n-1} + F_{n+1}$ for all positive integers n . (05 Marks)
- c. Find the number of distinct terms in the expansion of $(w + x + y + z)^{12}$. (06 Marks)

Module-3

- 5 a. Let $A = \{a, b, c, d\}$ and $B = \{1, 2, 3, 4, 5, 6\}$.
- i) How many functions are there from A to B ? How many of these are one-to-one? How many are onto? (06 Marks)
- ii) How many functions are there from B to A ? How many of these are one-to-one? How many are onto? (06 Marks)
- b. Prove that if $f: A \rightarrow B$, $g: B \rightarrow C$ are invertible functions, then $g \circ f: A \rightarrow C$ is invertible and $(g \circ f)^{-1} = f^{-1} \circ g^{-1}$. (06 Marks)
- c. For the Hasse diagram, given in Fig. Q5(c), write i) maximal ii) minimal iii) greatest and iv) least element (s). (04 Marks)

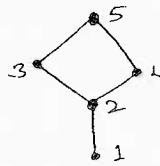


Fig. Q5(c)

OR

- 6 a. Let $f, g: \mathbb{Z}^+ \rightarrow \mathbb{Z}^+$, where for all $x \in \mathbb{Z}^+$, $f(x) = x + 1$ and $g(x) = \max\{1, x - 1\}$.
- i) What is the range of f ?
- ii) Is f a onto function?
- iii) Is f one-to-one?
- iv) What is the range of g ?
- v) Is g an onto function? (05 Marks)
- b. If $f: A \rightarrow B$ and $B_1, B_2 \subseteq B$, then prove the following :
- i) $f^{-1}(B_1 \cap B_2) = f^{-1}(B_1) \cap f^{-1}(B_2)$
- ii) $f^{-1}(B_1 \cup B_2) = f^{-1}(B_1) \cup f^{-1}(B_2)$
- iii) $f^{-1}(\overline{B_1}) = \overline{f^{-1}(B_1)}$ (06 Marks)
- c. Let $A = \{1, 2, 3, 4\}$, $R = \{(1, 3), (1, 1), (3, 1), (1, 2), (3, 3), (4, 4)\}$ be the relation on A . Determine whether the relation R is reflexive, irreflexive, symmetric, antisymmetric or transitive. (05 Marks)

Module-4

- 7 a. Determine the number of positive integers n where $1 \leq n \leq 100$ and n is not divisible by 2, 3 or 5. (05 Marks)
- b. Describe the expansion formula for rook polynomials. Find the rook polynomial for 3×3 board using the expansion formula. (05 Marks)
- c. Solve the recurrence relation $b_n = bD_{n-1} - b^2D_{n-2}$, $n \geq 3$ given $D_1 = b > 0$ and $D_2 = 0$. (06 Marks)

OR

- 8 a. In how many ways can we arrange the letters in the CORRESPONDENTS so that :
- There is no pair of consecutive identical letters?
 - There are exactly two pairs of consecutive identical letters
 - There are atleast 3 pairs of consecutive identical letters
- (06 Marks)
- b. Find the recurrence relation and the initial conditions for the sequence 0, 2, 6, 12, 20, 30, 42, Hence find the general term of the sequence. (05 Marks)
- c. Find the general solution of the equation $S(k) + 3S(k-1) - 4S(k-2) = 4^k$. (05 Marks)

Module-5

- 9 a. Define the following with an example
- Simple graph
 - Regular graph
 - Subgraph
 - Maximal subgraph
 - Induced subgraph.
- (05 Marks)
- b. Show that there exists no simple graphs corresponding to the following degree sequences
- 0, 2, 2, 3, 4
 - 1, 1, 2, 3
 - 2, 3, 3, 4, 5, 6
 - 2, 2, 4, 6.
- (04 Marks)
- c. Let $T = (V, E)$ be a complete m -ary tree with $|V| = n$. If T has ℓ leaves and i internal vertices, then prove the following :
- $n = m \cdot i + 1$
 - $\ell = (m-1)i + 1$
 - $i = \frac{(\ell-1)}{(m-1)} = \frac{(n-1)}{m}$
- (07 Marks)

OR

- 10 a. In the graph shown in Fig. Q10(a). Determine
- a walk from b to d that is not a trail
 - $b \rightarrow d$ trail that is not a path
 - a path from b to d
 - a closed walk from b to b that is not a circuit
 - a circuit from b to b that is not a cycle
 - a cycle from b to b
- (06 Marks)

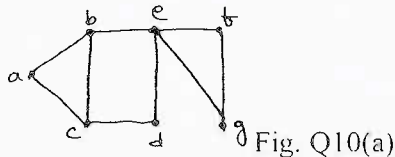


Fig. Q10(a)

- b. Determine the order $|V|$ of the graph $G = (V, E)$ in the following cases
- G is cubic graph with 9 edges
 - G is regular with 15 edges
 - G has 10 edges with 2 vertices of degree 4 and all other of degree 3.
- (06 Marks)
- c. Obtain the optimal prefix code for the string ROAD IS GOOD. (04 Marks)

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10CS36

Third Semester B.E. Degree Examination, June/July 2017
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.
 2. Programs must be neatly documented.

PART – A

- 1 a. What is reference variable? Explain with an example and write a program to swap values of two variables using reference variable. (05 Marks)
- b. Describe function overloading and write a program using overloaded function area to find area of circle, triangle and rectangle. (05 Marks)
- c. What is an inline function? What is the advantage of having a function inline? Write a C++ program to find maximum of three integers using inline function maximum (). (05 Marks)
- d. Illustrate with an examples, different data types supported by C++ language. (05 Marks)
- 2 a. What is data hiding? Write a C++ program to create a class complex, to add given two complex numbers and use following member functions, readData(), dispData() and computeData(). (05 Marks)
- b. What are constructor and destructor? Can you overload constructor and destructor? Justify. (08 Marks)
- c. What are static members of a class? Illustrate with an example and write a program to count the number of object created. (07 Marks)
- 3 a. What is friend function? Explain. Write a C++ program using Bridge friend function small() to find smallest of two numbers. (06 Marks)
- b. What is generic function and template instantiation? Write a C++ program using generic function swap() to exchange values of two integers, doubles and characters, and prints the values before and after swapping. (07 Marks)
- c. What is operator overloading? Why it is required? Write a C++ program to overload the operators '+' to add two complex numbers, '<<' to display complex numbers and '>>' to read complex numbers, using friend functions. (07 Marks)
- 4 a. What is inheritance? Explain the differences between the access specifier flags / visibility modes. (06 Marks)
- b. Explain single inheritance and multiple inheritance with the suitable diagram and syntaxes. (08 Marks)
- c. Write a C++ program to create a class called CSE (Name and USN) and using inheritance crate derived classes, UG (fee, stipend) and PG (fee, stipend) from it. (06 Marks)

PART – B

- 5 a. Explain constructor and destructor functions and how to pass arguments to constructors along with multilevel inheritance. (10 Marks)
- b. What is virtual base class? Explain with the suitable diagram and program. (10 Marks)
- 6 a. What is runtime polymorphism? How to achieve it? With the suitable example program explain the same. (10 Marks)
- b. Explain pure virtual function and abstract class with the suitable program. (10 Marks)
- 7 a. Explain input output manipulator with the suitable example. (10 Marks)
- b. Explain file operations with examples. (10 Marks)
- 8 a. What is an exception? Explain exception handling options with an example. (10 Marks)
- b. What is STL? What STL consists of? Explain in detail vector class. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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15CS42

Fourth Semester B.E. Degree Examination, June/July 2017 Software Engineering

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. What are the fundamental activities of software engineering? (04 Marks)
- b. With neat diagram, explain the water-fall model of software development process. (06 Marks)
- c. With a diagram, explain the rational unified process. (06 Marks)

OR

- 2 a. What is requirement specification? Explain various ways of writing system requirements. (06 Marks)
- b. Why the understanding of requirements from stake holders is difficult task? Explain. (05 Marks)
- c. Explain the different checks to be carried out during requirement validation process. (05 Marks)

Module-2

- 3 a. Draw a context model for patient information system. How the interactions are modeled? (06 Marks)
- b. Explain the terms class diagram, generalization and aggregation. (06 Marks)
- c. What is model Driven engineering? State the three types of abstract system models produced. (04 Marks)

OR

- 4 a. What are the things to be done for a design of object oriented system? How the objects are identified? (05 Marks)
- b. What is design pattern? Explain four elements of design pattern. (06 Marks)
- c. What is software reuse? State the general models of open source licenses. (05 Marks)

Module-3

- 5 a. State the two goals and three levels of granularity of software testing process. (05 Marks)
- b. What is test driven development? State the benefits of test driven developments. (05 Marks)
- c. Explain the six stages of acceptance testing process. (06 Marks)

OR

- 6 a. With neat diagram, show the software evolution process and explain the 'Lehman's Law' concern to system change. (10 Marks)
- b. What is software maintenance? State the activities of re-engineering process. (06 Marks)

Module-4

- 7 a. Explain the factors to be considered for approval of change. (05 Marks)
b. Explain the features provided by version management systems. (05 Marks)
c. What is configuration management? State the four activities of configuration management. (06 Marks)

OR

- 8 a. What is system building? State the features available in the system building tools. (10 Marks)
b. Explain the factors to be considered for release planning of system. (06 Marks)

Module-5

- 9 a. Explain the ways of coping with change and reduction of rework cost. (06 Marks)
b. Explain the practices involved in the extreme programming. (10 Marks)

OR

- 10 a. State the principles of agile methods. (05 Marks)
b. How the agile methods are scaled? State the coping of agile methods for large system engineering. (05 Marks)
c. Write a note on pair programming. (06 Marks)

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15CS43

Fourth Semester B.E. Degree Examination, June/July 2017 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define algorithm. Explain asymptotic notations, Big O, big Omega, big theta notations. (08 Marks)
b. Explain general plan of mathematical analysis of nonrecursive algorithms with example. (08 Marks)

OR

- 2 a. Define time and space complexity. Explain important problem types. (08 Marks)
b. Illustrate mathematical analysis of recursive algorithm for towers of hanoi. (08 Marks)

Module-2

- 3 a. Explain concept of divide and conquer. Write merge sort algorithm. (08 Marks)
b. Write a recursive algorithm for binary search and also bring out its efficiency. (08 Marks)

OR

- 4 a. Illustrate the tracing of quick sort algorithm for the following set of numbers: 25, 10, 72, 18, 40, 11, 64, 58, 32, 9 (08 Marks)
b. List out the advantages and disadvantages of divide and conquer method and illustrate the topological sorting for the following graph.

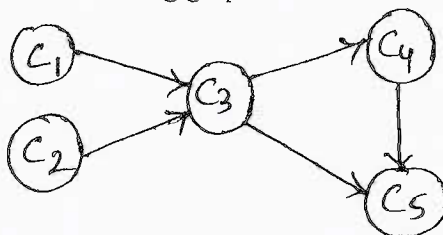


Fig.Q4(b)

(08 Marks)

Module-3

- 5 a. Explain Greedy criterion. Write a Prim's algorithm to find minimum cost spanning tree. (08 Marks)
b. Sort the given list of numbers using heap sort: 2, 9, 7, 6, 5, 8. (08 Marks)

OR

- 6 a. Write an algorithm to find single source shortest path. (08 Marks)
b. Construct a Huffman tree and resulting code word for the following:

Character	A	B	C	D	-
Probability	0.35	0.1	0.2	0.2	0.15

Encode the words DAD and ADD.

(08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain the concept of dynamic programming, with example. (08 Marks)
 b. Trace the following graph using Warshall's algorithm.

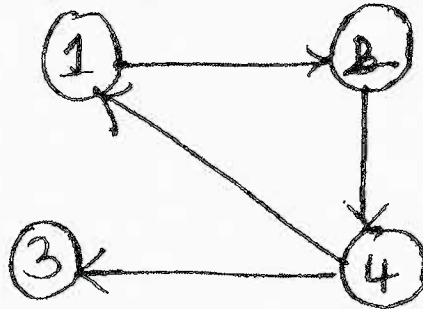


Fig.Q7(b)

(08 Marks)

OR

- 8 a. Explain Multistage graphs with example. Write multistage graph algorithm to forward approach. (08 Marks)
 b. Solve the following instance of Knapsack problem using dynamic programming. Knapsack capacity is 5.

Item	Weight	Value
1	2	\$12
2	1	\$10
3	3	\$20
4	2	\$15

(08 Marks)

Module-5

- 9 a. Explain backtracking concept. Illustrate N queens problem using backtracking to solve 4-Queens problem. (08 Marks)
 b. Solve subset sum problem for the following example, $s = \{3, 5, 6, 7\}$ and $d = 15$. Construct a state space tree. (08 Marks)

OR

- 10 a. Explain the concept of branch and bound and solve assignment problem for the following and obtain optimal solution.

		Job1	Job2	Job3	Job4
Person	a	9	2	7	8
	b	6	4	3	7
	c	5	8	1	8
	d	7	6	9	4

(08 Marks)

- b. Explain LC Branch and Bound and FIFO branch and bound. (08 Marks)

CBCS Scheme

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15CS44

Fourth Semester B.E. Degree Examination, June/July 2017 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain execution unit (EU) and Bus interface unit (BIU) of 8086 μ p with a neat diagram. (08 Marks)
b. Explain the different addressing modes used in 8086 μ p with suitable example. (08 Marks)

OR

- 2 a. Explain all bits of flag register of 8086 μ p with a neat diagram. Show the setting and resetting of flag bits with a suitable example. (06 Marks)
b. Write an assembly level program (ALP) to add two bytes of data stored at data 1 and data 2 and save the result in sum with comments. Identify all the directives found in the program. (06 Marks)
c. Show the memory dump for the following data section or data segment. (04 Marks)

```
· DATA
  ORG 0010H
  DATA 1 DB 25
  DATA 2 DB 10001001B
  DATA 3 DB 12H
  ORG 0020H
  DATA 4 DB '2591'
  ORG 0030H
  DATA 5 DW 9, 2, 7, 0CH, 00100000B, 5
  ORG 0040H
  DATA 6 DW 4 DUP (00H)
```

Module-2

- 3 a. Explain Rotate instructions with suitable example. (06 Marks)
b. With a suitable program show how a packed BCD value is converted to ASCII value. (04 Marks)
c. Assume that there is a class of five people. With following grades: 69, 87, 96, 45, 75. Write an ALP to find the highest grade. (06 Marks)

OR

- 4 a. Write an ALP that adds the following two multiword numbers and saves the result:
Data 1 = 548FB9963CE7H and
Data 2 = 3FCD4FA23B8DH (08 Marks)
b. Write an ALP to perform the following :
i) Clear the screen
ii) Set the cursor at row 8 and column 5 of the screen.
iii) Prompt "There is a message for you from VTU : to read it enter Y. If the user enters 'Y' or 'y' then the message "Hello! All the best for your exams" will appear on the screen. If the user enters any other key, then the prompt "No more messages for you" should appear on the next line. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-3

- 5 a. Explain handling of overflow problem arised in addition of signed numbers with a suitable example. (06 Marks)
- b. Explain XLAT instruction with example. (04 Marks)
- c. Explain 74138 decoder configuration to enable the memory address F000H to F7FFFH to connect four 8k RAMS. (06 Marks)

OR

- 6 a. Briefly explain the control word format of 8255 in I/O mode and BSR mode. Find the control word if PA = out, PB = in, PC0 – PC3 = in and PC4 -- PC7 = out. Use port addresses of 300H – 303H for the 8255 chip. Then get data from port B and send it to port A. (08 Marks)
- b. Assume that we have 4 bytes of hexadecimal data: 25H, 62H, 3FH and 52H.
- Find the checksum byte
 - Perform the checksum operation to ensure data integrity.
 - If the second byte 62H had been changed to 22H. Show how checksum detects the error. (08 Marks)

Module-4

- 7 a. Differentiate between RISC and CISC processors. (06 Marks)
- b. Explain ARM core data flow model with a neat diagram. (06 Marks)
- c. Discuss briefly how coprocessors can be attached to ARM processor. (04 Marks)

OR

- 8 a. Explain the architecture of a typical embedded device based on ARM core with a neat diagram. (08 Marks)
- b. Explain the concept of pipeline and interrupts used in ARM processor. (08 Marks)

Module-5

- 9 a. Explain the following instructions of ARM processor with suitable example.
i) MLA ii) QADD iii) SMULL iv) LSL. (08 Marks)
- b. Write an ALP to copy a block of data (Block 1) to another block (Block 2) using ARM instructions. (08 Marks)

OR

- 10 a. Write an ALP using ARM instructions that calls subroutine fact to find factorial of a given number. (08 Marks)
- b. Write short notes on memory access and branch instructions of ARM controller. (08 Marks)

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CBCS Scheme

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15CS45

Fourth Semester B.E. Degree Examination, June/July 2017

Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. How do name space helps in preventing pollution of the global namespace. (04 Marks)
- b. What is function polymorphism? Write a program in C++ using overloaded function area to find area of circle, triangle and rectangle. (06 Marks)
- c. Explain how one can bridge two classes using friend function. Write a C++ program to find the sum of two numbers using bridge friend function add(). (06 Marks)

OR

- 2 a. Can you overload constructor and destructor? Justify with suitable program. (06 Marks)
- b. What is reference variable? Explain. Also write a program in C++ to swap two int values and display the values before and after swapping. (05 Marks)
- c. What are static member of a class? Write a C++ program to count the number of objects created. (05 Marks)

Module-2

- 3 a. How “compile once and run anywhere” is implemented in JAVA? Discuss. (04 Marks)
- b. Write a program to calculate the average among the elements {8, 6, 2, 7} using for each in Java. How for each is different from for loop? (06 Marks)
- c. Explain type conversion, with an example. (06 Marks)

OR

- 4 a. List and explain the java buzzwords. (08 Marks)
- b. Explain the concepts of arrays in Java with examples. Also write a program that creates and initializes a four integer elements array. Find the sum and average of its values. (08 Marks)

Module-3

- 5 a. Briefly explain the role of interfaces while implementing multiple inheritances in Java. (06 Marks)
- b. Compare and contrast method overloading and method overriding with suitable examples. (06 Marks)
- c. When constructors are called in the class hierarchy? (04 Marks)

OR

- 6 a. With example, give two uses of super. (05 Marks)
- b. Define exception. Write a program which contains one method which will throw IllegalAccessException and use proper exception handlers so that exception should be printed. (06 Marks)
- c. Define package. What are the steps involved in creating user defined package with an example. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-4

- 7 a. How synchronization can be achieved for threads in Java? Explain with syntax. (06 Marks)
b. Explain the adaptor class with an example. (04 Marks)
c. With the syntax explain the use of isAlive() and Join() methods. (06 Marks)

OR

- 8 a. What are the differences between suspending and stopping the threads? (05 Marks)
b. Discuss delegation event model with suitable examples. (06 Marks)
c. Explain inner class with example. (05 Marks)

Module-5

- 9 a. What are the two types of applets? Explain the skeleton of an applet. Enlist applet tags. (06 Marks)
b. Write steps to create JTable, also write a program to demonstrate the same. (05 Marks)
c. Explain the applet architecture and demonstrate how to pass parameters for font size and font name in applets. (05 Marks)

OR

- 10 a. Explain briefly the components and containers used in swings. (05 Marks)
b. Explain JLabel and ImageIcon with program. (06 Marks)
c. What are applets? Explain different stages in the lifecycle of an applet. (05 Marks)

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10CS45

Fourth Semester B.E. Degree Examination, June/July 2017
Microprocessors

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Explain the program visible internal register – organization of 8086 microprocessor. (05 Marks)
- b. What is real mode addressing? Explain default segment and offset registers. (05 Marks)
- c. Write any five differences between real mode and protected mode memory system. (05 Marks)
- d. What is pipelining? How is it achieved in 8086? (05 Marks)
- 2 a. Explain with example the various data related addressing modes of 8086. (08 Marks)
- b. Explain the various descriptors used in 80286 – core 2 processors operating in protected mode. (06 Marks)
- c. Generate the machine code for the following 8086 instruction: (06 Marks)
 - (i) MOV AX, BX
 - (ii) MOV CL, [SI]
- 3 a. Write an assembly language program to add 10 non-negative 8 bit numbers. (08 Marks)
- b. Explain the following instructions with examples: (06 Marks)
 - (i) XCHG (ii) LEA (iii) LAHF (iv) CMP (v) LODSB (vi) STOSB
- c. What do you mean by assembler directives? Explain the following directives : (i) ORG (06 Marks)
- (ii) PROC and ENDP (iii) OFFSET. (06 Marks)
- 4 a. Explain the various string manipulation instructions with example. (10 Marks)
- b. Differentiate between short, near and far jump instructions with two examples of each. (10 Marks)

PART – B

- 5 a. Differentiate between macros and procedures. (06 Marks)
- b. Define modular programming. Explain with suitable example. (07 Marks)
- c. Distinguish between the 16 bit and 32 bit versions of C/C++ when using the assembler. (07 Marks)
- 6 a. Bring out the differences between 8086 and 8088 microprocessor. (06 Marks)
- b. With neat timing diagram, explain 8086 memory read cycle. (07 Marks)
- c. With neat diagram, explain the minimum mode system of 8086 microprocessor. (07 Marks)
- 7 a. Mention the differences between memory mapped I/O and isolated I/O. (06 Marks)
- b. How 8086 microprocessor selects 8 bit on 16 bit data from odd or even memory banks? (06 Marks)
- c. With neat diagram, explain simple NAND gate address decoding logic to select 2K × 8 EPROM for 8086 processor. (08 Marks)
- 8 a. Explain briefly the interrupt vector table of 8086 microprocessor. (10 Marks)
- b. Explain the pin-out of 8255 along with different operational modes. (10 Marks)

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CBCS Scheme

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15CS46

Fourth Semester B.E. Degree Examination, June/July 2017

Data Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is data communication? With a neat diagram, explain the four basic topologies. (05 Marks)
- b. Explain TCP/IP protocol suite with Encapsulation and decapsulation concepts. (08 Marks)
- c. Explain different characteristics of periodic analog signal. Find the phase in degree and radian of a sine wave with offset $\frac{1}{4}$ cycle with respect to time '0' (zero). (03 Marks)

OR

- 2 a. Draw line code of the sequence 010011 using NRZ, NRZ-L, NRZ-I, Manchester, RZ and differential Manchester schemes. (06 Marks)
- b. Explain digital signal transmissions methods. (06 Marks)
- c. What is noiseless channel? Find out maximum bit rate in noiseless channel with bandwidth of 3000 Hz transmitting a signal with two signal level. (04 Marks)

Module-2

- 3 a. Explain PCM and quantization process with steps and example. (08 Marks)
- b. Explain amplitude shift keying modulation process. (04 Marks)
- c. Find out bit rate if available bandwidth is 100 kHz which spans from 200 to 300 kHz. Consider ASK with $d = 1, r = 1$. (04 Marks)

OR

- 4 a. What is multiplexing? define synchronous TDM with data rate management strategies. (08 Marks)
- b. What is spread spectrum? Explain FHSS and bandwidth sharing. (08 Marks)

Module-3

- 5 a. How does datawords and codewords is represented in block coding and also explain how can errors be selected and corrected by using block coding. (10 Marks)
- b. Find the code word using CRC given data is 1101 and generator is 1100. (06 Marks)

OR

- 6 a. With a neat diagram, explain any two protocols of noisy channel. (12 Marks)
- b. Explain the frame format of HDLC protocol. (04 Marks)

Module-4

- 7 a. What is channelization? List and explain the channelization protocols. (12 Marks)
- b. Describe Gigabit Ethernet. (04 Marks)

OR

- 8 a. Describe pure ALOHA and slotted ALOHA. (06 Marks)
- b. Explain Carrier Sense Multiple Access with Collision Detection (CSMA/CD) (06 Marks)
- c. Define Bluetooth and its architecture. (04 Marks)

Module-5

- 9 a. Explain satellite networks and its categories. (12 Marks)
- b. Write a short note on Fixed WiMAX. (04 Marks)

OR

- 10 a. Explain mobile IP with phases. (12 Marks)
- b. Write a short note on IPV6 addressing. (04 Marks)

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10CS46

Fourth Semester B.E. Degree Examination, June/July 2017
Computer Organisation

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1
 - a. Explain in brief different types of key parameters that affect the processor performance. (05 Marks)
 - b. Draw and explain the connection between memory and processor, with the respective register. (05 Marks)
 - c. List the different systems used to represent signed numbers. Perform the following operations on the 5 – bit signed numbers using 2’s compliment representation system
 i) $(-8) + (-12)$ ii) $(-6) - (+2)$ iii) $(-8) - (+3)$. (10 Marks)

- 2
 - a. What is Little endian and Big endian memory? Represent any 32 bits number in big endian and little endian memory. (05 Marks)
 - b. Write an assembly language program to convert unpacked BCD number to packed BCD number. (05 Marks)
 - c. With example, explain any four addressing modes. (05 Marks)
 - d. With example, explain Logical shift and Arithmetic shift instruction. (05 Marks)

- 3
 - a. What is IO mapped IO and memory mapped IO? Explain them in briefly. (05 Marks)
 - b. With figure, explain Distributed Arbitration in detail. (10 Marks)
 - c. What are the different methods of DMA? Explain them in brief. (05 Marks)

- 4
 - a. With a block diagram, explain how output device is interfaced to processor. (10 Marks)
 - b. Explain with Timing signal of read operation on PCI (Peripheral Component Interconnect) bus by showing role of IRDY/TRDY. (10 Marks)

PART - B

- 5
 - a. With figure, explain Internal structure of Static memory. (05 Marks)
 - b. With figure, explain Internal organization of $2M \times 8$ dynamic memory chip. (10 Marks)
 - c. Explain in detail the Associative mapping of cache memory. (05 Marks)

- 6
 - a. Design and explain 4 bit carry look ahead adder. (10 Marks)
 - b. Perform signed multiplication of numbers $(+13)$ and (-6) by using bit pair recoding technique. (05 Marks)
 - c. Explain with example IEEE standard for floating point numbers. (05 Marks)

- 7
 - a. List out the action needed to execute the instruction add $(R_3), R_1$. Write and explain sequence of control steps for the execution of the same. (10 Marks)
 - b. With figure, explain Control Unit Organization. (10 Marks)

- 8
 - a. Explain the classic organization of a shared memory multiprocessor. (10 Marks)
 - b. Explain the different approaches used in multithreading. (10 Marks)

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10CS32

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017

Electronic Circuits

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Explain the phenomenon of thermal runaway. (06 Marks)
- b. Explain the working of a transistor switch. (06 Marks)
- c. Determine the operating point for a fixed bias circuit shown in Fig.Q1(c).

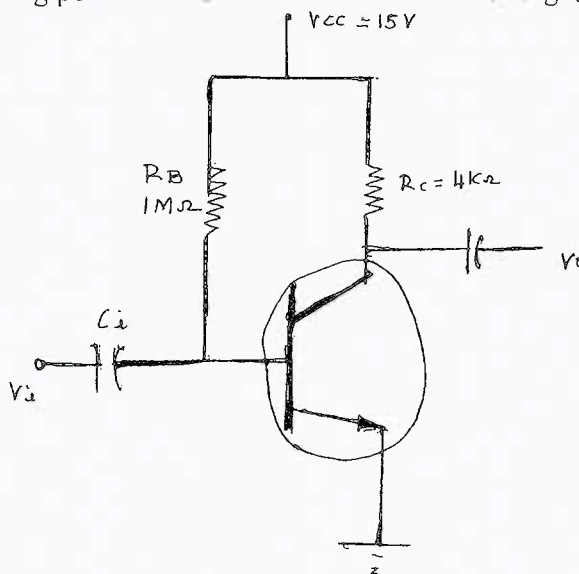


Fig.Q1(c) (08 Marks)

- 2 a. Explain the construction and working of a n channel enhancement MOSFET. (10 Marks)
- b. What are the differences between JFETs and MOSFETs? (05 Marks)
- c. Write a note on handling of MOSFETs. (05 Marks)
- 3 a. A photodiode has a noise current of 1fA, responsivity of 0.5 A/W, active area of 1 mm² and rise time of 3.5 ns. Determine: i) NEP, ii) Detectivity, iii) D*, iv) quantum efficiency. (04 Marks)
- b. What is an opto coupler? Define forward opto coupling efficiency, isolation voltage and bandwidth. (08 Marks)
- c. Explain the construction, characteristics and an application of a phototransistor with relevant diagrams. (08 Marks)
- 4 a. Derive expressions for Ai, Zi, Av and Yo for a transistor amplifier using h-parameter model. (12 Marks)
- b. Explain the need for cascading amplifier. Explain a two stage cascaded amplifier with a neat block diagram. (08 Marks)

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PART – B

- 5 a. Explain the different classes of large signal amplifiers with their characteristic specifications. (08 Marks)
- b. List the advantages of negative feedback. (06 Marks)
- c. For the OPAMP based non-inverting amplifier circuit shown in Fig.Q5(c), determine the voltage gain, input impedance in the presence of feedback given that open loop gain and input impedance of OPAMP are 80 dB and $1\text{ M}\Omega$ respectively.

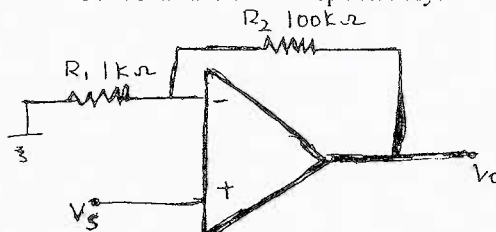


Fig.Q5(c)

(06 Marks)

- 6 a. What are voltage controlled oscillators? Explain the working of voltage controlled Hartley oscillator with a neat circuit diagram. (08 Marks)
- b. What is an RC high pass circuit? Explain how an RC high pass circuit can be used as a differentiator. (08 Marks)
- c. Explain the frequency stability criterion. (04 Marks)
- 7 a. Explain the working of a three terminal IC voltage regulator with a neat functional block diagram. (08 Marks)
- b. Define load regulation, line regulation, output, impedance, ripple rejection factor. (08 Marks)
- c. Differentiate between linear power supply and switched mode power supply. (04 Marks)
- 8 a. Determine the common mode gain for an OPAMP with differential voltage gain and CMRR of an OPAMP of 110 dB and 100 dB respectively. (04 Marks)
- b. Explain the working of an absolute value circuit with a neat circuit diagram. (08 Marks)
- c. Explain the working of an inverting comparator with hysteresis with a neat circuit diagram and suitable transfer characteristics. (08 Marks)

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CBCS Scheme

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15CS32

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the working of N – channel DE – MOSFET, with the help of neat diagram. (08 Marks)
 b. With circuit diagram, explain any two application of FET. (06 Marks)
 c. How CMOS can be used as inverting switch? (02 Marks)

OR

- 2 a. Design a voltage divider bias network using a DEMOSFET with supply voltage $V_{DD} = 16V$, $I_{DSS} = 10mA$ and $V_P = 5V$ to have a quiescent drain current of 5mA and gate voltage of 4V. (Assume the drain resistor R_D to be four times the source resistor R_S and $R_2 = 1k\Omega$). (08 Marks)
 b. Explain the performance parameters of Op-amp. (08 Marks)

Module-2

- 3 a. Minimize the following Boolean function using K – map method
 $f(a, b, c, d) = \Sigma m (5, 6, 7, 12, 13) + \Sigma d (4, 9, 14, 15)$. (06 Marks)
 b. Apply Quine Mc – Clusky method to find the essential prime implicants for the Boolean expression $f(a, b, c, d) = \Sigma m (1, 3, 6, 7, 9, 10, 12, 13, 14, 15)$. (10 Marks)

OR

- 4 a. A digital system is to be designed in which the month of the year is given as input is four bit form. The month January is represented as '0000', February as '0001' and so on. The output of the system should be '1' corresponding to the input of the month containing 31 days or otherwise it is '0'. Consider the excess number in the input beyond '1011' as don't care conditions for the system of four variables. (ABCD) find the following :
 i) Write truth table and Boolean expression in SOP Σm and POS ΠM form.
 ii) Using K – map simplify the Boolean expression of canonical mini term form.
 iii) Using Basic gates implement logical circuit. (10 Marks)
 b. What is Hazard? List the type of hazards and explain static 0 and static – 1 hazard. (06 Marks)

Module-3

- 5 a. Implement the following function using 8:1 multiplexer $f(a, b, c, d) = \Sigma m (0, 1, 5, 6, 8, 10, 12, 15)$. (06 Marks)
 b. Realize the following function using 3:8 decoder
 i) $f(a, b, c) = \Sigma m (1, 2, 3, 4)$ ii) $f(a, b, c) = \Sigma m (3, 5, 7)$. (04 Marks)
 c. What is Magnitude Comparator? Explain 1 bit magnitude comparator. (06 Marks)

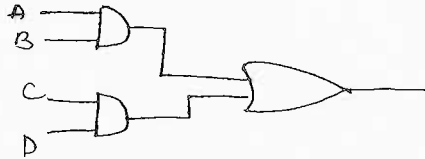
OR

- 6 a. Design 7 – segment decoder using PLA. (08 Marks)
 b. Differentiate between Combinational and Sequential circuit. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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- c. Write VHDL code for given circuit. (04 Marks)

Fig.Q6(c)



Module-4

- 7 a. What is Race around condition? With block diagram and truth table, explain the working of JK master – slave flip – flop. (10 Marks)
 b. Give State transition diagram and characteristics equation for JK and SR Flip Flop. (06 Marks)

OR

- 8 a. With neat diagram, explain Ring counter. (04 Marks)
 b. What is Shift Register? With neat diagram, explain 4 bit parallel in serial out shift registers. (08 Marks)
 c. Compare Synchronous and Asynchronous counter. (04 Marks)

Module-5

- 9 a. Define Counter. Design A synchronous counter for the sequence $0 \rightarrow 4 \rightarrow 1 \rightarrow 2 \rightarrow 6 \rightarrow 0 \rightarrow 4$ using JK Flip – Flop. (12 Marks)
 b. Explain Digital clock, with neat diagram. (04 Marks)

OR

- 10 a. Explain the Binary ladder with Digital input of 1000. (06 Marks)
 b. Explain 2 bit simultaneous A/D converter. (10 Marks)

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15CS33

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is an algorithm? Explain the criteria that an algorithm must satisfy. (08 Marks)
 b. Write a function to sort integers using selection sort algorithm. (04 Marks)
 c. Consider two polynomials,
 $A(x) = 4x^{15} + 3x^4 + 5$ and $B(x) = x^4 + 10x^2 + 1$
 Show diagrammatically how these two polynomials can be stored in a 1-D array. Also give its C representation. (04 Marks)

OR

- 2 a. Write the Knuth Morris Pratt pattern matching algorithm and apply the same to search the pattern 'abcdabcy' in the text 'abcxabcdabxabcdabedabcy'. (08 Marks)
 b. Write the fast transpose algorithm to transpose the given sparse matrix. Express the given sparse matrix as triplets and find its transpose.

$$A = \begin{bmatrix} 10 & 0 & 0 & 25 & 0 \\ 0 & 23 & 0 & 0 & 45 \\ 0 & 0 & 0 & 0 & 32 \\ 42 & 0 & 0 & 31 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 30 & 0 & 0 \end{bmatrix}$$

(08 Marks)

Module-2

- 3 a. Write the algorithm to implement a stack using dynamic array whose initial capacity is 1 and array doubling is used to increase the stack's capacity (that is dynamically reallocate twice the memory) whenever an element is added to a full stack. Implement the operations-push, pop and display. (08 Marks)
 b. Write the algorithm for of tower of Hanoi. (04 Marks)
 c. Write a note on Ackerman's function. (04 Marks)

OR

- 4 a. List the disadvantages of linear queue and explain how is it solved in circular queue. Give the algorithm to implement a circular queue with suitable example. (08 Marks)
 b. Convert the infix expression, $((a/(b-c+d))*(e-a)*c)$ to postfix expression. Write a function to evaluate that postfix expression and trace for the given data $a = 6, b = 3, c = 1, d = 2, e = 4$. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Give the node structure to create a singly linked list of integers and write functions to perform the following :
- Create a list.
 - Assume the list contains 3 nodes with data 10, 20, 30. Insert a node with data 40 at the end of the list.
 - Insert a node with data 50 between the nodes having data values 10 and 20.
 - Display the singly linked list. (08 Marks)
- b. What is the advantage of doubly linked list over singly linked list? Illustrate with an example. (04 Marks)
- c. For the given sparse matrix, write the diagrammatic linked list representation.

$$A = \begin{bmatrix} 0 & 10 & 0 & 0 \\ 3 & 0 & 0 & 5 \\ 8 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 8 & 0 \end{bmatrix}$$

(04 Marks)

OR

- 6 a. Write the functions for singly linked list with integer data to search an element in the list. (08 Marks)
- b. Write the node structure for linked representation of polynomial. Explain the algorithm to add two polynomials represented using linked lists. (08 Marks)

Module-4

- 7 a. What is a tree? With suitable example define (i) Binary tree (ii) Level of a binary tree (iii) Complete binary tree. (08 Marks)
- b. Write the routines to traverse the given tree using (i) Pre-order traversal and (ii) Post order traversal. (08 Marks)

OR

- 8 a. What is a binary search tree? Write algorithm to implement for recursive search or iterative search for a binary search tree. (08 Marks)
- b. Write the routines for, (i) Create a binary tree. (ii) Testing for equality of binary trees. (08 Marks)

Module-5

- 9 a. What is a graph? Give the matrix and adjacency list representation of graphs. (08 Marks)
- b. Write an algorithm for bubble sort. Trace the algorithm for the data : 30, 20, 10, 40, 80, 60, 70. (08 Marks)

OR

- 10 a. Explain open addressing and chaining used to handle overflows in hashing. (05 Marks)
- b. Explain directoryless dynamic hashing. (05 Marks)
- c. Briefly explain basic operations that can be performed on a file. Explain indexed sequential file organization. (06 Marks)

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CBCS Scheme

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15CS34

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017

Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. With a neat diagram, explain basic operational concept of computer. (06 Marks)
- b. What is performance measurement? Explain overall SPEC rating for computer. (04 Marks)
- c. Draw single bus structure, discuss about memory mapped I/O. (06 Marks)

OR

- 2 a. What is an addressing mode? Explain any three addressing modes with example. (10 Marks)
- b. Explain BIG-ENDIAN and LITTLE-ENDIAN methods of byte addressing with proper example. (06 Marks)

Module-2

- 3 a. What is an Interrupt? With example illustrate concept of interrupt. (06 Marks)
- b. Define Exception. Explain 2 kinds of exception. (04 Marks)
- c. With a neat diagram explain DMA controller. (06 Marks)

OR

- 4 a. Explain PCI bus. (05 Marks)
- b. List SCSI bus signal with their functionalities. (05 Marks)
- c. Explain the tree structure of USB with split bus operation. (06 Marks)

Module-3

- 5 a. Briefly explain any two mapping function used in cache memory. (08 Marks)
- b. With a neat diagram explain the internal organization of memory chip (2M×8 and dynamic memory chip). (08 Marks)

OR

- 6 a. Explain the following :
i) Hit Rate and Miss penalty ii) Virtual memory organization. (08 Marks)
- b. With diagram explain how virtual memory translation take place. (08 Marks)

Module-4

- 7 a. Draw 4-bit carry-look ahead adder and explain. (06 Marks)
- b. Perform multiplication for -13 and +09 using Booth's Algorithm. (06 Marks)
- c. Design a logic circuit to perform addition/subtraction of 'n' bit number X and Y. (04 Marks)

OR

- 8 a. Explain IEEE standard for floating point number. (06 Marks)
- b. With figure explain circuit arrangement for binary division. (10 Marks)

Module-5

- 9 a. With a figure explain single bus organization of datapath inside a processor. (08 Marks)
- b. What are the actions required to Execute a complete instruction Add (R3), R₁. (02 Marks)
- c. Give the control sequence for execution of instruction ADD (R3), R₁. (06 Marks)

OR

- 10 a. Briefly explain the block diagram of camera. (08 Marks)
- b. Explain multiprocessors. Justify how time is reduced. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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10CS35

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Data Structures with C

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Define pointer. With examples, explain pointer declaration, pointer initialization and use of the pointer in allocating a block of memory dynamically. (06 Marks)
b. What is recursion? What are the various types of recursion? (05 Marks)
c. Explain the following: i) Big - Oh ii) Big - Ω iii) Big - θ. (09 Marks)

- 2 a. Define structure and union with suitable example. (08 Marks)
b. Write a C program using structures with following fields NAME, ROLLNO, marks in M₁, M₂, M₃ and find Total and average. Read any N records and print all the records and also print the record who is having second highest total with all the fields. (12 Marks)

- 3 a. Define queue. Write a function for both INSERT() and DELETE() functions. (08 Marks)
b. Write an algorithm to convert infix to postfix expression and apply the same to convert following expressions from infix to postfix:
i) a/b – c + d * e - a * c ii) (a – b) + c/d \$n e. (12 Marks)

- 4 a. What is a linked list? Explain the different types of linked list with diagram. (10 Marks)
b. Write a C-program to implement the insertion and delete operation on queue using linked list. (10 Marks)

PART – B

- 5 a. Define binary tree. For the given tree find the following:
i) Siblings
ii) Leaf nodes
iii) Ancestors
iv) Depth of a tree
v) Level of trees. (10 Marks)

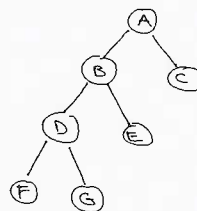


Fig.Q.5(a)

- b. Explain the following with suitable example:
i) Strictly binary tree
ii) Complete binary tree
iii) Skewed tree. (06 Marks)
c. What is heap? Explain the different types of heaps. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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- 6 a. What is a binary search tree? Draw the binary search tree for the following list 14, 5, 6, 2, 18, 20, 15, 19, -3, 16. (10 Marks)
- b. What is a forest? Explain the different methods of traversing a tree with following tree. (10 Marks)

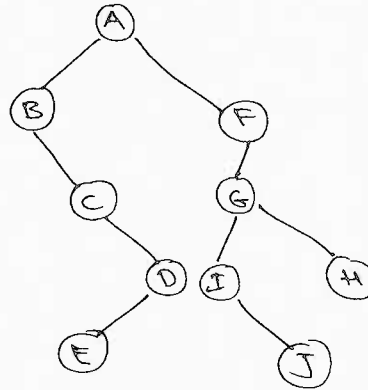


Fig.Q.6(b)

- 7 a. What is a priority queue? Explain the various types of priority queues. (08 Marks)
- b. Write a short note on:
- Binomial heaps
 - Priority heaps
 - Fibonacci heaps.
- (12 Marks)
- 8 a. What is an AVL tree? Write the algorithm to insert an item into AVL tree. (10 Marks)
- b. Explain the following:
- Red-black trees
 - Splay trees.
- (10 Marks)

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Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

*Note: Answer FIVE full questions, selecting
at least TWO questions from each part.*

PART – A

- 1 a. Describe the following characteristics of object oriented programming:
i) Encapsulation ii) Polymorphism iii) Inheritance. (06 Marks)
- b. Explain function overloading and its benefits. Write a C++ program to define three overloaded functions area(), to find area of rectangle, area of rectangular box and area of circle. (08 Marks)
- c. How can you make member functions inline? Give an example. (06 Marks)
- 2 a. What are constructors and destructors? What are their characteristics? Explain different types of constructors. (12 Marks)
- b. Explain static data members and static member functions with an example. (08 Marks)
- 3 a. Discuss function template and its usage. Write a C++ program to create a template function to swap two integers, two floats and two characters. (10 Marks)
- b. What is operator overloading? Write a C++ program to demonstrate overloading of operator + and -. Use friend function for + and member function for - stating the difference. (10 Marks)
- 4 a. What is inheritance? Explain the advantages of inheritance. (06 Marks)
- b. Explain single and multilevel inheritance with examples. (10 Marks)
- c. What is the effect of using the protected access specifier on the visibility of a base class member? (04 Marks)

PART – B

- 5 a. In what order are the class constructor and destructor invoked when a derived class object is created? Explain with an example. (08 Marks)
- b. Write a short note on virtual base class. (06 Marks)
- c. Write a C++ program and explain how to show passing parameters to base class constructors. (06 Marks)
- 6 a. Write a short note on virtual function with example. (06 Marks)
- b. What is pure virtual function and abstract class? Write a C++ program to implement an abstract class. (10 Marks)
- c. Differentiate between early and late binding. (04 Marks)
- 7 a. Write a note on file open modes. (05 Marks)
- b. What are the manipulators? Discuss 4 predefined manipulators supplied by C++ I/O streams. (05 Marks)
- c. What are iostreams? Explain the stream class hierarchy with a neat diagram. (10 Marks)
- 8 a. What do you mean by exception handling? Discuss try-catch mechanism. Write a C++ program to show the implementation of exception handling. (10 Marks)
- b. Why do we use standard template library? What are the components of STL? Discuss each component briefly with examples. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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CBCS Scheme

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15CS36

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017

Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Let p, q and r be propositions having truth values 0, 0 and 1 respectively. Find the truth values of the following compound proposition
 i) $(p \wedge q) \rightarrow r$ ii) $p \rightarrow (q \wedge r)$ iii) $p \wedge (r \rightarrow q)$ iv) $p \rightarrow (q \rightarrow (\neg r))$ (04 Marks)
- b. Define tautology. Prove that for any propositions p, q, r the compound proposition $[(p \vee q) \wedge \{(p \rightarrow r) \wedge (q \rightarrow r)\}] \rightarrow r$ is tautology. (04 Marks)
- c. Establish the validity of the following argument
 $\forall x, [p(x) \vee q(x)]$
 $\exists x, \neg p(x)$
 $\forall x, [\neg q(x) \vee r(x)]$
 $\forall x, [s(x) \rightarrow \neg r(x)]$
 $\therefore \exists x \neg s(x)$ (04 Marks)
- d. Give i) direct proof and ii) proof by contradiction for the following statement. "If 'n' is an odd integer, then n+9 is an even integer". (04 Marks)

OR

- 2 a. Define dual of a logical statement. Verify the principle of duality for the following logical equivalence $[\sim (p \wedge q) \rightarrow \sim p \vee (\sim p \vee q)] \Leftrightarrow (\sim p \vee q)$. (04 Marks)
- b. Prove the following by using laws of logic
 i) $p \rightarrow (q \rightarrow r) \Leftrightarrow (p \wedge q) \rightarrow r$
 ii) $[\sim p \wedge (\sim q \vee r)] \vee [(q \wedge r) \vee (p \wedge q)] \Leftrightarrow r$. (04 Marks)
- c. Establish the validity of the following argument using the rules of inference:
 $[p \wedge (p \rightarrow q) \wedge (s \vee t) \wedge (r \rightarrow \sim q)] \rightarrow (s \vee t)$ (04 Marks)
- d. Define i) open sentence ii) quantifiers. For the following statements, the universe comprises all non-zero integers. Determine the truth values of each statement :
 i) $\exists x, \exists y (xy = 1)$ ii) $\exists x, \forall y (xy = 1)$ iii) $\forall x, \exists y (xy = 1)$. (04 Marks)

Module-2

- 3 a. By mathematical induction, prove that
 $1^2 + 3^2 + 5^2 + \dots + (2n-1)^2 = \frac{n(2n+1)(2n-1)}{3}$. (05 Marks)
- b. For the Fibonacci sequence show that (05 Marks)

$$F_n = \frac{1}{\sqrt{5}} \left[\left(\frac{1+\sqrt{5}}{2} \right)^n - \left(\frac{1-\sqrt{5}}{2} \right)^n \right]$$
- c. A woman has 11 close relatives and she wishes to invite 5 of them to dinner. In how many ways can she invite them in the following situations :
 i) There is no restriction on the choice
 ii) Two particular persons will not attend separately iii) Two particular persons will not attend together. (06 Marks)

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OR

- 4 a. Prove that every positive integer $n \geq 24$ can be written as a sum of 5's and/or 7's. (04 Marks)
 b. Find an explicit definition of the sequence defined recursively by $a_1 = 7$, $a_n = 2a_{n-1} + 1$ for $n \geq 2$. (04 Marks)
 c. i) How many arrangements are there for all letters in the word SOCIOLOGICAL?
 ii) In how many of these arrangements A and G are adjacent? In how many of these arrangements all the vowels are adjacent? (04 Marks)
 d. Find the coefficient of i) $x^9 y^3$ in the expansion of $(2x - 3y)^{12}$ ii) $a^2 b^3 c^2 d^5$ in the expansion of $(a + 2b - 3c + 2d + 5)^{10}$. (04 Marks)

Module-3

- 5 a. Let a function $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = x^2 + 1$. Find the images of $A_1 = \{2, 3\}$, $A_2 = \{-2, 0, 3\}$, $A_3 = (0, 1)$ and $A_4 = [-6, 3]$. (04 Marks)
 b. ABC is an equilateral triangle whose sides are of length one cm each. If we select 5 points inside the triangle, prove that at least two of these points are such that the distance between them is less than $\frac{1}{2}$ cm. (04 Marks)
 c. Let f, g, h be functions from \mathbb{Z} to \mathbb{Z} defined by $f(x) = x - 1$, $g(x) = 3x$ and $h(x) = \begin{cases} 0 & \text{if } x \text{ is even} \\ 1 & \text{if } x \text{ is added} \end{cases}$. Determine $(fo(goh))(x)$ and $((fog)oh)(x)$ and verify that $fo(goh) = (fog)oh$. (04 Marks)
 d. For $A = \{a, b, c, d, e\}$ the Hasse diagram for the Poset (A, R) is as shown in Fig Q5(d). Determine the relation matrix for R and Construct the digraph for R . (04 Marks)

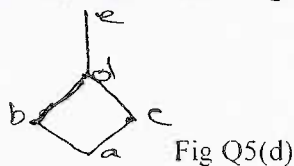


Fig Q5(d)

OR

- 6 a. Let $A = \{1, 2, 3\}$ and $B = \{2, 4, 5\}$. Determine the
 i) Number of binary relations on A .
 ii) Number of relations from A to B that contain $(1, 2)$ and $(1, 5)$
 iii) Number of relations from A, B that contain exactly five ordered pairs
 iv) Number of binary relations on A that contains at least seven ordered pairs. (04 Marks)
 b. Let $A = B = \mathbb{R}$ be the set of the real numbers, the functions $f : A \rightarrow B$ and $g : B \rightarrow A$ be defined by $f(x) = 2x^3 - 1$, $\forall x \in A$; $g(y) = \left\{ \frac{1}{2}(y+1) \right\}^{1/3}$ $\forall y \in B$. Show that each of f and g is the inverse of the other. (04 Marks)
 c. Define a relation R on $A \times A$ by $(x_1, y_1) R (x_2, y_2)$ iff $x_1 + y_1 = x_2 + y_2$, where $A = \{1, 2, 3, 4, 5\}$.
 i) Verify that R is an equivalence relation on $A \times A$.
 ii) Determine the equivalence classes $[(1, 3)]$ and $[(2, 4)]$. (04 Marks)
 d. Consider the Hasse diagram of a POSET (A, R) given in Fig Q6(d). If $B = \{c, d, e\}$ find all upper bounds, lower bounds, the least upper bound and the greatest lower bound of B . (04 Marks)

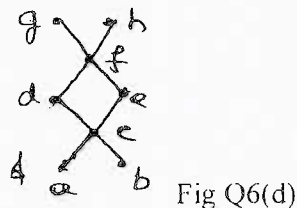


Fig Q6(d)

Module-4

- 7 a. Determine the number of positive integers n such that $1 \leq n \leq 100$ and n is not divisible by 2, 3, or 5. (04 Marks)
- b. In how many ways can the 26 letters of the English alphabet be permuted so that none of the patterns CAR, DOG, PUN or BYTE occurs? (04 Marks)
- c. A girl student has Sarees of 5 different colors, blue, green, red, white and yellow. On Monday she does not wear green, on Tuesdays blue or red, on Wednesday blue or green, on Thursday red or yellow; on Friday red. In how many ways can she dress without repeating a color during a week (from Monday to Friday)? (04 Marks)
- d. The number of affected files in a system 1000 (to start with) and this increases 250% every two hours. Use a recurrence relation to determine the number of virus affected files in the system after one day. (04 Marks)

OR

- 8 a. In how many ways can one arrange the letters in the word CORRESPONDENTS so that
- There is no pair of consecutive identical letters?
 - There are exactly two pairs of consecutive identical letters? (06 Marks)
- b. An apple, a banana, a mango and an orange are to be distributed to four boys $B_1, B_2, B_3,$ and B_4 . The boys B_1 and B_2 do not wish to have apple, the boy, B_3 does not want banana or mango and B_4 refuses orange. In how many ways the distribution can be made so that no boy is displeased? (05 Marks)
- c. Solve the recurrence relation $a_n = 3a_{n-1} - 2a_{n-2}$ for $n \geq 2$ given that $a_1 = 5$ and $a_2 = 3$. (05 Marks)

Module-5

- 9 a. Define :
- Bipartite graph
 - Complete bipartite graph
 - Regular graph
 - Connected graph with an example. (04 Marks)
- b. Define isomorphism. Verify the two graphs are isomorphic (04 Marks)

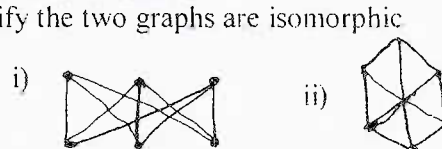


Fig Q9(b)

- c. Show that a tree with n vertices has $n-1$ edges. (04 Marks)
- d. Obtain an optimal prefix code for the message ROAD IS GOOD. Indicate the code. (04 Marks)

OR

- 10 a. Determine the order $|V|$ of the graph $G = (V, E)$ in
- G is a cubic graph with 9 edges
 - G is regular with 15 edges
 - G has 10 edges with 2 vertices of degree 4 and all other vertices of degree 3. (04 Marks)
- b. Prove that in a graph
- The sum of the degrees of all the vertices is an even number and is equal to twice the number of edges in the graph.
 - The number of vertices of odd degrees is even. (04 Marks)
- c. Discuss the solution of Konigsberg bridge problem. (04 Marks)
- d. Define optimal tree and construct an optimal tree for a given set of weights $\{4, 15, 25, 5, 8, 16\}$. Hence find the weight of the optimal tree. (04 Marks)

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10CS42

Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Graph Theory and Combinatorics

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Define a graph and degree of a vertex of a graph. Prove that in every graph the number of vertices of odd degree is even. (06 Marks)
- b. Define self-complementary graph. How many edges must G have, if G is a self-complementary graph? Give one example for each of the self complementary graph on 4 vertices and 5 vertices. (07 Marks)
- c. Show that a connected graph with exactly 2 vertices of odd degree has an Euler Trail. Find the Euler circuit in the graph shown below. (07 Marks)

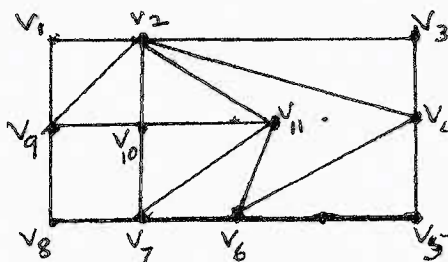


Fig.Q.1(c)

- 2 a. State Euler's fundamental theorem on planar graphs. Verify the same for the following graph. Also construct the dual of the same graph. Fig.Q.2(a). (06 Marks)

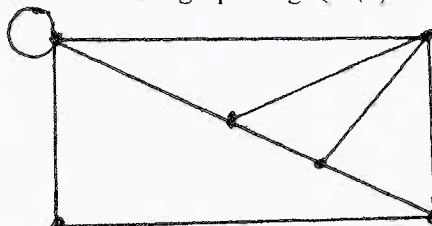


Fig.Q.2(a)

- b. Check the planarity of the following graph by the method of elementary reduction Fig.Q.2(b). (07 Marks)

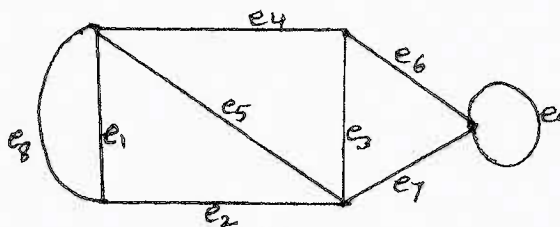


Fig.Q.2(b)

- c. Define chromatic number and chromatic polynomial of a graph. Find the chromatic polynomial for the cycle C_4 . What is its chromatic number? (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 3 a. Define a tree and a forest. Prove that a tree with two or more vertices contains at least 2 leaves. Further, show that if a tree has exactly two pendent vertices, the degree of every non-pendant vertex is two. (06 Marks)
- b. Show that a Hamilton path is a spanning tree. Draw all the spanning trees of the graph Fig.Q.3(b). (06 Marks)

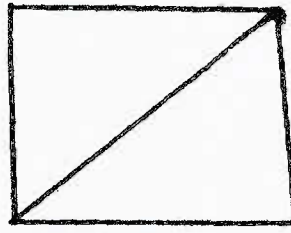


Fig.Q.3(b)

- c. Construct an optimal prefix code for the letters of the word 'ENGINEERING'. Hence deduce the code for this word. (08 Marks)
- 4 a. Apply Prim's algorithm to find a minimal spanning tree for the graph Fig.Q.4(a). (07 Marks)

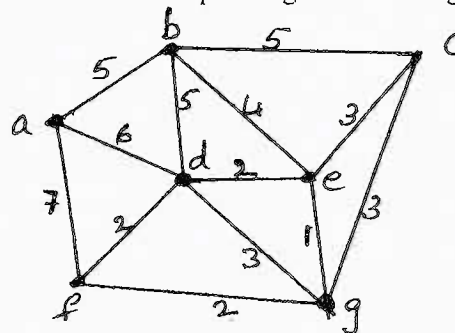


Fig.Q.4(a)

- b. Apply Dijkstra's algorithm to the weighted digraph, to find the shortest distance from vertex 1 to each of the other vertices Fig.Q.4(b). (08 Marks)

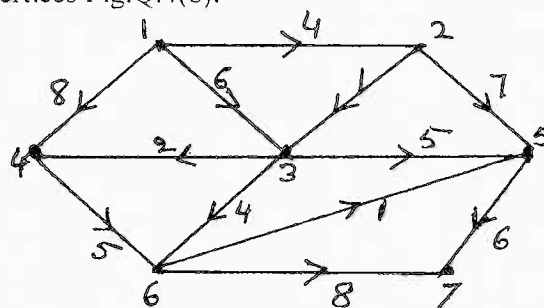


Fig.Q.4(b)

- c. Define matching. Five students s_1, s_2, s_3, s_4, s_5 are members of 3 committees c_1, c_2, c_3 . The committee c_1 has s_4 and s_3 as members, the committee c_2 has s_1, s_3, s_5 as members and the committee c_3 has s_2 and s_5 as members. Each committee is to select a student representative. Can a selection be made in such a way that each committee has a distinct representative? (05 Marks)

PART – B

- 5 a. How many arrangements are there for all the letters in the word ‘SOCIOLOGICAL’? In how many of these arrangements i) A and G are adjacent? ii) All the vowels are adjacent? (07 Marks)
- b. Find the coefficient of i) x^{12} in the expansion of $x^3(1 - 2x)^{10}$ and ii) $x^2y^2z^3$ in the expansion of $(3x - 2y - 4z)^7$. (06 Marks)
- c. Define Catalan number. Using the moves R: $(x, y) \rightarrow (x + 1, y)$ and u: $(x, y) \rightarrow (x, y + 1)$ find in how many ways can one go.
 i) From $(0, 0)$ to $(6, 6)$ and not rise above the line $y = x$?
 ii) From $(2, 1)$ to $(7, 6)$ and not rise above the line $y = x - 1$? (07 Marks)
- 6 a. Find the number of non-negative integer solutions of the equation $x_1 + x_2 + x_3 + x_4 = 18$ under the condition $x_i \leq 7$ for $i = 1, 2, 3, 4$. (07 Marks)
- b. There are n pairs of children’s gloves in a box. Each pair is of a different colour. Suppose the right gloves are distributed at random to n children and there after the left gloves are also distributed to them at random. Find the probability that.
 i) No child gets a matching pair.
 ii) Every child gets a matching pair.
 iii) Exactly one child gets a matching pair. (06 Marks)
- c. Find the rook polynomial for the board shown below (shaded part). (07 Marks)

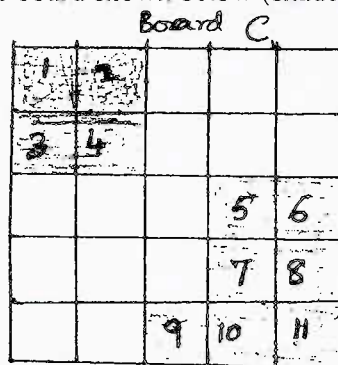


Fig.Q.6(c).

- 7 a. Using generating function, derive the formula $\sum_{k=0}^n k^3 = \left\{ \frac{n(n+1)}{2} \right\}^2$. (07 Marks)
- b. In how many ways can 12 oranges be distributed among 3 children A, B, C so that A gets at least 4, B and C gets at least 2, but C gets no more than 5? (07 Marks)
- c. A company appoints 11 software engineers, each of whom is to be assigned to one of four offices of the company. Each office should get at least one of these engineers. In how many ways can these assignments be made? (06 Marks)
- 8 a. Find the recurrence relation and the initial condition for the sequence 0, 2, 6, 12, 20, 30, 42, ... Hence find the general term of the sequence. (06 Marks)
- b. Solve the recurrence relation $a_n + a_{n-1} - 6a_{n-2} = 0$ for $n \geq 2$ given that $a_0 = -1$ and $a_1 = 8$. (07 Marks)
- c. Find the generating function for the recurrence relation, $a_{n+2} - 5a_{n+1} + 6a_n = 2$, $n \geq 0$ and $a_0 = 3, a_1 = 7$. Hence solve it. (07 Marks)

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10CS44

Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017

UNIX and Shell Programming

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Explain the salient features of UNIX operating system. (07 Marks)
- b. With neat diagram explain the architecture of UNIX clearly bring out the division of labor between Kernel and shell. (08 Marks)
- c. Explain the following commands with examples. (05 Marks)
 - i) cat ii) pwd iii) who iv) tty v) bc
- 2 a. What is file permission? What are the different ways of setting file permission? Explain. (07 Marks)
- b. A file's current permission are rw - r - xr - - specify the chmod expression required to change them for the following. Using both relative and absolute methods of assigning permissions. (08 Marks)
 - i) -w-r--r-- ii) r--r----- iii) rwxrwxrwx iv) -----
- c. Explain the three modes of Vi editor with diagram. (05 Marks)
- 3 a. What is shell process? What are the different phases in the creation of process? (07 Marks)
- b. Explain what wild - card patterns match : (08 Marks)
 - [A - Z]????* ii) *[0 - 9]* iii) *![0 - 9] iv) *.[!S] [!h]
- c. What is process status? Explain ps command with options. (05 Marks)
- 4 a. Differentiate between hard link and soft link in UNIX with examples. (06 Marks)
- b. Explain the following filters with examples: (08 Marks)
 - i) tail ii) tr iii) pr iv) cut.
- c. Explain the following environment variables with examples: (06 Marks)
 - i) LOGNAME ii) PATH iii) HOME.

PART - B

- 5 a. With the example, explain the grep command any five options. (10 Marks)
- b. What is sed? Explain the difference between line addressing and context addressing in sed. (10 Marks)
- 6 a. What is shell programming? Write a shell program in order to perform the following tasks: (08 Marks)
 - i) Display current login users ii) print current directory iii) Process status.
- b. Explain the shell features of while and for loop with examples. (08 Marks)
- c. Explain trap in shell scripts with suitable example. (04 Marks)
- 7 a. Explain the following Built in variables of awk with examples. (08 Marks)
 - i) FS ii) NF iii) FILENAME iv) NR.
- b. With suitable examples, explain if and while statement in awk. (06 Marks)
- c. Explain the following built-in functions of awk with examples : (06 Marks)
 - i) Substr ii) length iii) index.
- 8 a. Explain the string handling functions of perl with examples. (08 Marks)
- b. Explain the following with respect to PERL with examples: (06 Marks)
 - i) For each looping construct ii) Join.
- c. Write a PERL program to print numbers that are accepted from the keyboard using while. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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10CS46

Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Computer Organization

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.*

PART – A

1.
 - a. What is pipelining? How does it improve the performance of the computer? (08 Marks)
 - b. Compare CISC versus RISC processors. (04 Marks)
 - c. Explain clearly SPEC rating and its significance. (08 Marks)

2.
 - a. What is the need of an addressing mode? Explain three addressing modes with examples. (08 Marks)
 - b. Convert the following numbers to signed, 2's compliment binary number and add them.
 (i) 7 and -5 (ii) -10 and -13 (04 Marks)
 - c. What is stack frames? Explain. (04 Marks)
 - d. Explain the shift and rotate operations with example. (04 Marks)

3.
 - a. In modern computers, why interrupts are required? Support your claim with a suitable example. (04 Marks)
 - b. Showing the possible register configuration in DMA interface, explain direct memory access. (08 Marks)
 - c. With a neat sketch, explain the individual input and output interface circuits. Also elicit their salient features. (08 Marks)

4.
 - a. Write a note on PCI configuration and explain with neat figure the single processor system configurations. (08 Marks)
 - b. Explain the different phases in the operations of SCSI bus speed in detail. (06 Marks)
 - c. Explain the following :
 (i) USB addressing (ii) USB protocols. (06 Marks)

PART – B

5.
 - a. Describe SDRAM and DDR SDRAM operations for data transfer between main memory and cache memory systems. (08 Marks)
 - b. Explain any one cache mapping function. (06 Marks)
 - c. Consider a two level cache with access times of 5 ns and 80 ns respectively. If the hit rates are 95% and 75% respectively in the two caches and the memory access time is 250 ns, what is the average access time? (04 Marks)
 - d. Calculate the effective address time if average page fault service time of 20 milliseconds and a memory access time of 80 nano seconds. (Assume the probability of a page fault as 10%). (02 Marks)

6.
 - a. Explain how a 16-bit carry look ahead adder can be built from a 4-bit adder. (08 Marks)
 - b. Using the non storing division algorithm, perform the division of numbers 23 by 5 (23 ÷ 5). (08 Marks)
 - c. Explain the IEEE standards for floating point number. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Explain the process of fetching a word from memory using timing diagram of memory read operations, with an example. (08 Marks)
- b. Bring out any four difference between hardwired and microprogrammed control. (04 Marks)
- c. With a neat diagram, explain the microinstruction sequencing organization. (08 Marks)
- 8 a. Write a short note on power wall. (06 Marks)
- b. State and explain the Amdhal's law and compute the speed up gained for the following. Suppose that the new CPU is 10 times faster in computing floating point calculations and old CPU is busy with floating point calculations 40% of the time. Calculate speed up gained by the new CPU. (08 Marks)
- c. With a neat block diagram bring out the characteristics of shared memory multiprocessors (SMPs). (06 Marks)

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CBCS Scheme

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15CS42

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018 Software Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is software? List the fundamental software engineering activities. Mention and explain the key challenges or the general issues facing software engineering. (05 Marks)
- b. List and explain any five software engineering code of ethics. (05 Marks)
- c. Write block diagram for illustrating incremental development model. State at least two benefits and the problems in incremental development. (06 Marks)

OR

- 2 a. Explain functional, non-functional and domain requirements with at least one example for each. (03 Marks)
- b. Write the structure of the requirement document as suggested by IEEE standards. (10 Marks)
- c. List out all the stake-holders in Mental Health Care Patient Management System (MHC-PMS). Write a note on interviewing stake-holders for requirements discovery. (03 Marks)

Module-2

- 3 Write short notes on:
 - a. Context models with context diagram for MHC-PMS. (06 Marks)
 - b. Interaction models (05 Marks)
 - c. Behavioral models (05 Marks)

OR

- 4 a. Write a neat block diagram and explain the phases of Rational Unified Process (RUP). (06 Marks)
- b. List out all the activities in an object oriented design process. (02 Marks)
- c. What is a sequence model? Write the diagram for sequence model of operations in collecting data from a weather station and explain. (08 Marks)

Module-3

- 5 a. State and explain development testing and its three levels - unit testing, component testing and system testing. (04 Marks)
- b. List out all the guidelines for testing. (04 Marks)
- c. Explain test-driven development (TDD), with a block diagram. Explain TDD activities and benefits of TDD. (08 Marks)

OR

- 6 a. With appropriate block diagram, explain the software evolution process. (06 Marks)
- b. Define "program evolution dynamics". Discuss Lehman laws for program evolution dynamics. (10 Marks)

Module-4

- 7 a. Explain software pricing. List and briefly explain the factors affecting software pricing. (06 Marks)
b. List and explain various COCOMO cost estimation models. (10 Marks)

OR

- 8 a. List out the questions to be answered by the quality management team to divide whether or not the software is fit for its intended purpose. (06 Marks)
b. Explain the various inspection checklists for software inspection process. (06 Marks)
c. What are product metrics? Explain its two classes of metrics. (04 Marks)

Module-5

- 9 a. Draw the block diagram and explain the process of prototype development. What are the benefits of a prototype? Write briefly about throw away prototypes. (10 Marks)
b. List and explain any six extreme programming practices. (06 Marks)

OR

- 10 a. List all the four key features of testing in XP. (02 Marks)
b. What is pair programming? List the advantages of pair programming. (04 Marks)
c. Explain SCRUM. Draw and explain block diagram for the SCRUM process. List all the key characteristics of this process. Mention the advantages of SCRUM. (10 Marks)

CBCS Scheme

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15CS43

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define an algorithm. Discuss the criteria of an algorithm with an example. (06 Marks)
- b. Prove that : If $t_1(n) \in O(g_1(n))$ and $t_2(n) \in O(g_2(n))$ then
 $t_1(n) + t_2(n) \in O(\max\{g_1(n), g_2(n)\})$ (06 Marks)
- c. Explain the two common ways to represent a graph with an example (04 Marks)

OR

- 2 a. Consider the following algorithm
Algorithm GUESS (A[] [])
for $i \leftarrow 0$ to $n - 1$
 for $j \leftarrow 0$ to i
 A [i] [j] $\leftarrow 0$
 - i) What does the algorithm compute? (03 Marks)
 - ii) What is basic operation? (07 Marks)
 - iii) What is the efficiency of this algorithm? (06 Marks)
- b. List and explain important problem types that are solved by computer. (07 Marks)
- c. Design an algorithm for checking whether all elements in a given array are distinct or not. Derive its worst complexity. (06 Marks)

Module-2

- 3 a. Explain divide and conquer technique. Write a recursive algorithm for finding the maximum and minimum element from a list. (08 Marks)
- b. Apply quick sort to sort the list E, X, A, M, P, L, E in alphabetical order. Draw the tree of the recursive calls made. (08 Marks)

OR

- 4 a. Discuss Strassen's matrix multiplication and derive its time complexity. (08 Marks)
- b. Design merge sort algorithm and discuss its best-case, average-case and worst-case efficiency. (08 Marks)

Module-3

- 5 a. Solve the greedy knapsack problem where
 $m = 10, n = 4, P = (40, 42, 25, 12), W = (4, 7, 5, 3)$. (06 Marks)
- b. What is job sequencing with deadlines problem? Let $n = 5$, profits [10, 3, 33, 11, 40] and deadlines [3, 1, 1, 2, 2] respectively. Find the optimal solution using greedy algorithm. (05 Marks)
- c. Define minimum cost spanning tree (MST). Write Prim's algorithm to construct minimum cost spanning tree. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Design Dijkstra's algorithm and apply the same to find the single source shortest path for graph taking vertex 'a' as source of Fig. Q6(a). (08 Marks)

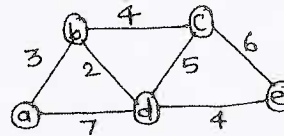


Fig. Q6(a)

- b. Construct a Huffman code for the following data :

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

Encode the text ABACABAD and decode the text 100010111001010, using the above code.

(04 Marks)

- c. Construct the heap for the list 2, 9, 7, 6, 5, 8 by the bottom-up algorithm. (04 Marks)

Module-4

- 7 a. Define transitive closure. Write Warshall's algorithm to compute transitive closure. Find its efficiency. (08 Marks)
 b. Apply Floyd's algorithm to find all pair shortest path for the graph of Fig. Q7(b). (08 Marks)

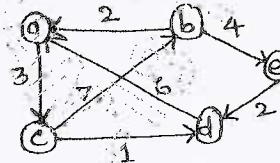
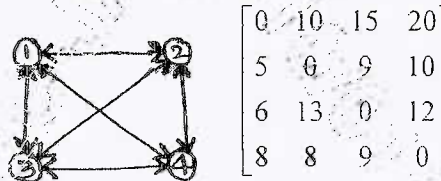


Fig. Q7(b)

OR

- 8 a. For the given cost matrix, obtain optimal cost tour using dynamic programming. (08 Marks)



0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

Fig. Q8(a)

- b. Write a pseudocode to find an optimal binary search tree by dynamic programming. (08 Marks)

Module-5

- 9 a. Write the pseudocode for backtracking algorithm. Let $w = \{3, 5, 6, 7\}$ and $m = 15$. Find all possible subsets of w that sum to m . Draw the state space tree that is generated. (09 Marks)
 b. Draw the portion of the state space tree for m - colorings of a graph when $n = 4$ and $m = 3$. (07 Marks)

OR

- 10 a. With the help of a state space tree, solve the Travelling Salesman Problem (TSP) of Fig. Q10(a), using branch-and-bound algorithm. (08 Marks)

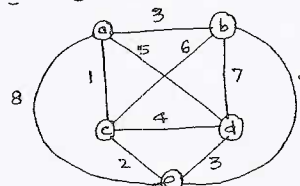


Fig. Q10(a)

- b. Explain the classes of NP - Hard and NP - complete. (08 Marks)

CBCS Scheme

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15CS44

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Microprocessor and Microcontroller

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the architecture of 8086 microprocessor with a neat diagram along with functions of various blocks. (06 Marks)
- b. With an example distinguish between physical address, logical address and offset address. If CS = 2000 h, DS = 3000 h, SS = 4000 h, ES = 5000 h, BX = 0020 h, BP = 0030 h. Find physical address for (i) MOV AL, [BP] (ii) MOV CX, [BX]. (04 Marks)
- c. Explain the following addressing modes of 8086:
 - i) Register indirect
 - ii) Based indexed indirect
 - iii) Direct memory. (06 Marks)

OR

- 2 a. What are assembler directives? Explain the following assembler directives (i) PROC. (ii) Assume, (iii) PTR. (04 Marks)
- b. Write assembly language program to add 5 bytes of data stored in data segment. (04 Marks)
- c. With syntax, explain the following control transfer instructions:
 - i) Conditional transfer
 - ii) Unconditional transfer instruction. (08 Marks)

Module-2

- 3 a. Explain the syntax of following instructions with an example:
 - i) DAA ii) MUL iii) AND iv) SHR v) CMP vi) AAM (06 Marks)
- b. Write a program to convert lower case to upper case by reading string from KB and print the converted string at 10th row, 20th column after clearing the screen. (06 Marks)
- c. Write an ALP to count the number of one's and zero's in a given 8 bit data using rotate instructions. (04 Marks)

OR

- 4 a. Explain the syntax of following instructions with example: i) AAA, ii) Shl, iii) DIV, iv) RCR. (04 Marks)
- b. What is an interrupt? Explain various types with an interrupt vector table. (06 Marks)
- c. Write an ALP to sort a given set of 16 bit numbers in ascending order using any sorting method. (06 Marks)

Module-3

- 5 a. With an example, explain how to identify over flow and under flow using flags in a flag register for performing arithmetic operation on 16 bit number. (06 Marks)
- b. Write the syntax of following instruction and explain with an example: (i) CBW, (ii) IDIV, (iii) CMPSB, (iv) Xlat. (04 Marks)
- c. Design a memory system for 8086 with one 64 KB RAM and one 64 KB ROM at address 30000h and F0000h show the complete design along with memory mapping and draw the final diagram with address decoder. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. With block diagram, explain 8255 and write control word register format for P_A output, P_B input in mode 0. (06 Marks)
- b. Write an ALP to read P_B and check number of one's in a given 8 bit data at P_B and display FFh on P_A if it is even parity else 00h on P_A if it is odd parity. (05 Marks)
- c. Write a program using string instructions to accept a string from keyboard and check for palindrome and accordingly display appropriate message. (05 Marks)

Module-4

- 7 a. Compare microprocessor with microcontroller. (04 Marks)
- b. Explain the programmer's model of ARM processor with complete register sets available. (04 Marks)
- c. With diagram explain the various blocks in a 3 stage pipeline of ARM processor organization. (04 Marks)
- d. Explain registers used under various modes. (04 Marks)

OR

- 8 a. Explain the structure of ARM cross development tool kit. (06 Marks)
- b. Describe the various modes of operation of ARM processor. (05 Marks)
- c. Explain the various fields in Current Program Status Register (CPSR). (05 Marks)

Module-5

- 9 a. Explain the syntax with example the following instructions of ARM processor (i) MVN, (ii) RSB, (iii) ORR, (iv) MLA, (v) LDR. (05 Marks)
- b. Write a program to display message "Hellow world" using ARM7 instructions. (04 Marks)
- c. Explain various formats of add instructions based on operands of ARM7 processor. (04 Marks)
- d. If $r_5 = 5$, $r_7 = 8$ and using the following instruction, write values of r_5 , r_7 after execution `MOV r7, r5, LSL # 2`. (03 Marks)

OR

- 10 a. Explain software interrupt instruction of ARM processor. (04 Marks)
- b. Explain various types of multiply instructions with syntax and example. (04 Marks)
- c. What are the salient features of ARM instruction set? (05 Marks)
- d. If $r_1 = 0b1111$, $r_2 = 0b0101$, find r_0 after `BIC r0, r1, r2`. (03 Marks)

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10CS45

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Microprocessors

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

1.
 - a. What is microprocessor? Write a brief note on history of microprocessor start from 4004 μ p to Pentium processors. (05 Marks)
 - b. Explain the microprocessor based computer system with block diagram. (04 Marks)
 - c. Explain the program model visible register organization of 8086 μ p. (06 Marks)
 - d. Explain the concept of segment and offsets in real mode access to a memory location with default segment and offset register pairs. (05 Marks)

2.
 - a. Explain the protected memory addressing with the formats of descriptors of 80286 μ p and 80386 μ p. (06 Marks)
 - b. What are the advantages of memory paging? Illustrate the concept of memory paging with neat diagram. (06 Marks)
 - c. Discuss the following addressing modes with examples:
 - i) Register
 - ii) Register indirect
 - iii) Base-plus-index
 - iv) Register relative
 (08 Marks)

3.
 - a. Draw the format of the 16 bit instruction mode. The instruction MOV CL, [SI] stands for "Move the 8 bit contents of memory location indirectly specified by SI to the register CL". Encode the instruction into machine code using the instruction format. The opcode for MOV operation is 100010₍₂₎. (06 Marks)
 - b. Describe the following instructions with examples:
 - i) PUSH
 - ii) XLAT
 - iii) XCHG
 - iv) MUI
 (08 Marks)
 - c. What are assembler directives? Describe the following assembler directives.
 - i) ASSUME
 - ii) PROC
 - iii) ORG
 (06 Marks)

4.
 - a. Describe how the AAM instruction converts from binary to BCD. (04 Marks)
 - b. Describe the result of executing the following sequence of instructions:


```
MOV AL, 01010101(2)
AND AL, 00011111(2)
OR AL, 11000000(2)
XOR AL, 00001111(2)
NOT AL
```

 (06 Marks)
 - c. Write a note on conditional jump instructions. (04 Marks)
 - d. Describe the following instruction with examples:
 - i) LOOP
 - ii) WAIT
 - iii) RET
 (06 Marks)

PART - B

5.
 - a. Write the difference between macro and procedure and write example for each. (06 Marks)
 - b. Explain PUBLIC and EXTRN directive with program module example. (07 Marks)
 - c. Write a mixed language program that converts binary to ASCII. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6 a. Draw the pin-out diagram of 8086 in maximum mode and minimum mode and explain the minimum mode pins. (08 Marks)
- b. With diagram describe how the demultiplexing of address/data done in 8086 microprocessor. (04 Marks)
- c. Using timing diagram, describe the I/O read bus cycle in 8086 μ p. (04 Marks)
- d. Write the difference between 8086 μ p and 8088 μ p. (04 Marks)
- 7 a. Explain with diagram how 74LS138 decodes 2764 EPROMs for a 64×8 section of memory in an 8088 based system. Assume starting address is $F0000_{16}$. (08 Marks)
- b. Explain the 8086 memory interfacing with diagram. (08 Marks)
- c. Differentiate between memory mapped I/O and I/O mapped I/O (Isolated I/O). (04 Marks)
- 8 a. Write a note on 82C55 programmable peripheral interface with pin-out diagram. (06 Marks)
- b. Describe the six modes of operation of 8254 counter with diagrams. (06 Marks)
- c. Write a note on interrupt vector table with diagram. (04 Marks)
- d. Write a note on DMA operation. (04 Marks)

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15CS46

Fourth Semester B.E. Degree Examination, June/July 2018
Data Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define Data Communication. Explain any two fundamental characteristics of Data communication and basic network topology. (08 Marks)
- b. List out the causes of transmission impairment. Explain the characteristics of analog and digital signals. (08 Marks)

OR

- 2 a. List out the network criteria. Explain TCP/IP protocol suite with neat diagram. (08 Marks)
- b. Define Line coding and list out its characteristics. Represent the following sequence 1011001011 using polar and bipolar scheme. (08 Marks)

Module-2

- 3 a. List out the types of transmission modes. Explain the steps of pulse code modulation process, with an example. (08 Marks)
- b. Explain FSK and QAM modulation process, with suitable example. (08 Marks)

OR

- 4 a. Define Multiplexing. Explain synchronous TDM with data rate management and its limitations. (10 Marks)
- b. List out three phases of circuit – switched network. Explain Data gram – switched network. (06 Marks)

Module-3

- 5 a. Define Cyclic code. Find the codeword using CRC for given data word 1001 and divisor 1011. (08 Marks)
- b. Define Frames. Explain the steps of flow control at data link layer with diagram. (08 Marks)

OR

- 6 a. Explain Stop – and – Wait protocol with neat diagram. (08 Marks)
- b. Explain the frame structure of PPP protocol, with neat diagram. (08 Marks)

Module-4

- 7 a. List out the Random Access Protocols and explain CSMA/CA. (10 Marks)
- b. List out channelization protocols. Explain CDMA. (06 Marks)

OR

- 8 a. Explain Wireless – LAN, with neat architecture and list out its characteristics. (08 Marks)
- b. Explain the layers of Bluetooth, with neat diagram. (08 Marks)

Module-5

- 9 a. List the difference between IPV₄ and IPV₆. Explain any two methods of converting from IPV₄ to IPV₆. (08 Marks)
- b. Explain the IP Datagram, Header format, with neat diagram. (08 Marks)

OR

- 10 a. Define Home address in mobile IP. Explain three phases for communication in mobile IP. (08 Marks)
- b. Define WiMax. Explain fourth generation (4G) of cellular telephone. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

CBCS Scheme

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15CS46

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Data Communication and Networking

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define data communication. Explain the fundamental characteristics of a data communication system. With a neat diagram, explain the components of data communication. (06 Marks)
- b. Explain TCP/IP protocol suite of computer networks with a neat diagram. (08 Marks)
- c. Assume that five devices are connected in a mesh topology. How many duplex links are needed? How many ports are needed for each? (02 Marks)

OR

- 2 a. Explain different causes for transmission impairments during signal transmission through media. (06 Marks)
- b. Define line coding. List out its characteristics. Represent the sequence 10100110 using polar and biphase schemes. (08 Marks)
- c. A network with a bandwidth of 10 Mbps can pass only an average of 18000 frames per minute with each frame carrying an average of 10000 bits. What is the throughput of this network? (02 Marks)

Module-2

- 3 a. Explain with suitable diagram PCM encoder used for analog to digital conversion with example. (08 Marks)
- b. Define multiplexing. State and explain the data rate management to handle disparity in input data rates in TDM. (05 Marks)
- c. Four 1 Kbps connections are multiplexed together. A unit is 1 bit. Find:
 - i) Duration of 1 bit before multiplexing.
 - ii) Transmission rate of link.
 - iii) Duration of each time slot. (03 Marks)

OR

- 4 a. Briefly explain with neat diagrams, ASK and FSK modulation techniques and specify the bandwidth requirement. (06 Marks)
- b. We need to send data 3 bits at a time at a bit rate of 3 Mbps. The carrier frequency is 10 MHz. Calculate the number of levels (different frequencies, band rate and band width). (04 Marks)
- c. Explain how message can be sent from one system to another using datagram approach and calculate the total delay with appropriate diagrams. (06 Marks)

Module-3

- 5 a. Find the code word at sender site using CRC given dataword 101001111 and generator 10111. (05 Marks)
- b. Explain different frame types in HDLC. (06 Marks)
- c. Explain transition phases of PPP protocol. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain with neat diagram, simple parity check code. (06 Marks)
b. Explain with examples, computation of internet checksum. List the steps undertaken by sender and receiver for error detection. (05 Marks)
c. Explain stop-and-wait protocol with appropriate diagrams. (05 Marks)

Module-4

- 7 a. Explain working of CSMA/CD with suitable flow diagram. (07 Marks)
b. A network using CSMA/CD has a bandwidth of 10 Mbps. If the propagation time is 25.6 μ s, what is the minimum size of the frame? (03 Marks)
c. Define Bluetooth and explain the architecture of the same. (06 Marks)

OR

- 8 a. Define is channelization. Explain CDMA with an example. (06 Marks)
b. A pure ALOHA network transmits 200 bits frames on a shared channel of 200 kbps. What is the throughput if the system produces 1000 frames per second. (04 Marks)
c. Discuss 802.3 MAC frame format. (06 Marks)

Module-5

- 9 a. Explain the operation of cellular telephony. (06 Marks)
b. Explain transition from IPV4 to IPV6. (06 Marks)
c. Discuss special addresses supported by IPV6. (04 Marks)

OR

- 10 a. Explain IP datagram header format with neat diagram and give the description of each field. (08 Marks)
b. Explain the working of mobile IP with diagram. (08 Marks)

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10CS46

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Computer Organization

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART - A

- 1 a. With a neat block diagram, explain the different functional units of a digital computer. (06 Marks)
- b. Explain how byte addressability can be achieved using little endian and big endian memory representation. Write an example for each. (06 Marks)
- c. Perform the following operations on the 5-bit signed numbers using 2's complement representation system. Also indicate whether overflow has occurred or not.
 - i) $(-10) + (-13)$
 - ii) $(-10) - (+4)$
 - iii) $(-3) + (-8)$
 - iv) $(-10) - (+7)$. (08 Marks)
- 2 a. Define Addressing Mode, explain the following addressing modes with an example and also show the effective address in each case :
 - i) Absolute
 - ii) Indirect
 - iii) Index (10 Marks)
- b. Illustrate and explain with neat diagrams and examples, how logical shift and rotate instructions are implemented? (10 Marks)
- 3 a. What do you mean by interrupt? Explain polling and vectored interrupts. (06 Marks)
- b. Define bus arbitration. Explain the centralized arbitration with a neat diagram. (06 Marks)
- c. What is DMA? Explain how the DMA controllers are used in a computer system. (08 Marks)
- 4 a. Explain the following with respect to USB :
 - i) Characteristics
 - ii) Architecture
 - iii) Addressing. (10 Marks)
- b. Discuss the main phases involved in the operation of SCSI bus. (08 Marks)
- c. Differentiate between serial port and parallel port. (02 Marks)

PART - B

- 5 a. With the help of a neat block diagram, explain the working of a $1K \times 1$ memory cell organization. (10 Marks)
- b. Explain the memory hierarchy with respect to speed, size and cost with a neat diagram. (05 Marks)
- c. With a block diagram, explain the working principle of direct mapping cache memory. (05 Marks)

- 6 a. Discuss with a neat diagram, the design of a 4-bit carry-look ahead adder. (10 Marks)
b. Perform multiplication for +13 and -6 using Booth's Algorithm. (05 Marks)
c. With a neat figure, explain the circuit arrangement for binary division. (05 Marks)
- 7 a. List out the actions needed to execute the instruction Add (R₃), R₁. Write and explain sequence of control steps for execution of the same. (10 Marks)
b. With a neat block diagram, explain hardwired control unit. Show the generation Z_{in} and End control signals. (10 Marks)
- 8 a. With a neat diagram, explain the organization of a shared memory multi processor. (08 Marks)
b. What is hardware multithreading? Explain the two approaches to hardware multithreading. (08 Marks)
c. Discuss: i) SISD ii) SIMD iii) MIMD iv) MISD. (04 Marks)

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15CS32

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018 Analog and Digital Electronics (ADE)

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- Explain the operation and characteristics of N-channel JFET. (08 Marks)
 - With block diagram, explain the operation of a Astable multivibrator using IC 555. (08 Marks)

OR

- With circuit diagram, explain the operation of a Relaxation oscillator. (06 Marks)
 - Fig. Q2(b), shows a Biasing configuration using DEMOSFET given that the saturation drain current is 8mA and the pinch off voltage is -2V.

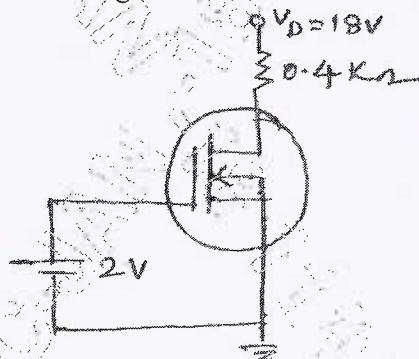


Fig. Q2(b)

- Determine the value of gate source voltage drain current of drain source voltage. (06 Marks)
 - Write the advantages of MOSFET over JFET. (04 Marks)

Module-2

- Give the simplest logic circuit for following logic equation where d represents don't care condition for following locations:
 $F(A, B, C, D) = \sum m(7) + d(10, 11, 12, 13, 14, 15)$. (06 Marks)
 - Simplify the following Boolean function by using Quine – McClusky method.
 $F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 8, 10, 12, 13)$. (10 Marks)

OR

- What are Hazards? Explain the types of Hazards and it covers. (08 Marks)
 - Discuss Briefly an HDL Implementation models. (04 Marks)
 - Explain the concept of Duality in Digital circuits. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. What is multiplexer? Design a 32:1 multiplexer using 16:1 MUX and one 2:1 multiplexer. (05 Marks)
- b. Show how using a 3 to 8 Decoder and multi input OR Gates following Boolean Expressions can be realized simultaneously. (06 Marks)
- $$F(A, B, C) = \sum m (0, 4, 6)$$
- $$F(A, B, C) = \sum m (1, 2, 3, 7)$$
- $$F(A, B, C) = \sum m (0, 5)$$
- c. Show how two 1 to 16 DEMUX can be connected to get 1 to 32 DEMUX. (05 Marks)

OR

- 6 a. Explain parity Generators and checkers using suitable examples. (05 Marks)
- b. What is Magnitude Comparator? Explain 1 bit magnitude comparator. (05 Marks)
- c. What is PLA? Design seven segment Display using PLA. (06 Marks)

Module-4

- 7 a. Explain 4 bit serial in parallel out register. (04 Marks)
- b. Explain a 3 bit binary Ripple up counter. Give the block diagram, truth table and output waveforms. (06 Marks)
- c. Explain the working of JK master slave Flip Flop along with implementation using NAND Gates. (06 Marks)

OR

- 8 a. Design synchronous MOD – 6 counter with truth table and state diagram. (06 Marks)
- b. What is universal shift Register? Explain any one application of universal shift register with block diagram and truth table. (06 Marks)
- c. Write the comparison between Synchronous and Asynchronous counter. (04 Marks)

Module-5

- 9 a. Explain 5 bit Resistive divider with diagram. (06 Marks)
- b. Explain with neat diagram the working principle of Digital clock. (05 Marks)
- c. Explain the terms Accuracy and Resolution for D/A converter. (05 Marks)

OR

- 10 a. Explain with Block diagram the operation of successive approximation converter. (08 Marks)
- b. Explain counter type A/D converter with diagram. (08 Marks)

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15CS32

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018 Analog and Digital Electronics (ADE)

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- Explain the operation and characteristics of N-channel JFET. (08 Marks)
 - With block diagram, explain the operation of a Astable multivibrator using IC 555. (08 Marks)

OR

- With circuit diagram, explain the operation of a Relaxation oscillator. (06 Marks)
 - Fig. Q2(b), shows a Biasing configuration using DEMOSFET given that the saturation drain current is 8mA and the pinch off voltage is -2V.

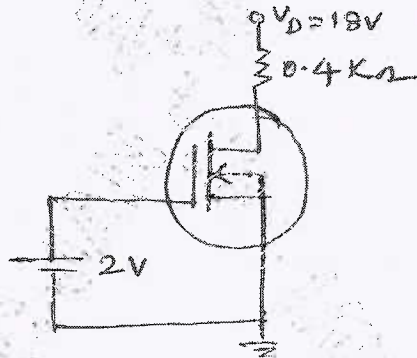


Fig. Q2(b)

- Determine the value of gate source voltage drain current of drain source voltage. (06 Marks)
 - Write the advantages of MOSFET over JFET. (04 Marks)

Module-2

- Give the simplest logic circuit for following logic equation where d represents don't care condition for following locations:
 $F(A, B, C, D) = \sum m(7) + d(10, 11, 12, 13, 14, 15)$. (06 Marks)
 - Simplify the following Boolean function by using Quine – McClusky method.
 $F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 8, 10, 12, 13)$. (10 Marks)

OR

- What are Hazards? Explain the types of Hazards and it covers. (08 Marks)
 - Discuss Briefly an HDL Implementation models. (04 Marks)
 - Explain the concept of Duality in Digital circuits. (04 Marks)

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Module-3

- 5 a. What is multiplexer? Design a 32:1 multiplexer using 16:1 MUX and one 2:1 multiplexer. (05 Marks)
- b. Show how using a 3 to 8 Decoder and multi input OR Gates following Boolean Expressions can be realized simultaneously. (06 Marks)
- $$F(A, B, C) = \sum m (0, 4, 6)$$
- $$F(A, B, C) = \sum m (1, 2, 3, 7)$$
- $$F(A, B, C) = \sum m (0, 5)$$
- c. Show how two 1 to 16 DEMUX can be connected to get 1 to 32 DEMUX. (05 Marks)

OR

- 6 a. Explain parity Generators and checkers using suitable examples. (05 Marks)
- b. What is Magnitude Comparator? Explain 1 bit magnitude comparator. (05 Marks)
- c. What is PLA? Design seven segment Display using PLA. (06 Marks)

Module-4

- 7 a. Explain 4 bit serial in parallel out register. (04 Marks)
- b. Explain a 3 bit binary Ripple up counter. Give the block diagram, truth table and output waveforms. (06 Marks)
- c. Explain the working of JK master slave Flip Flop along with implementation using NAND Gates. (06 Marks)

OR

- 8 a. Design synchronous MOD – 6 counter with truth table and state diagram. (06 Marks)
- b. What is universal shift Register? Explain any one application of universal shift register with block diagram and truth table. (06 Marks)
- c. Write the comparison between Synchronous and Asynchronous counter. (04 Marks)

Module-5

- 9 a. Explain 5 bit Resistive divider with diagram. (06 Marks)
- b. Explain with neat diagram the working principle of Digital clock. (05 Marks)
- c. Explain the terms Accuracy and Resolution for D/A converter. (05 Marks)

OR

- 10 a. Explain with Block diagram the operation of successive approximation converter. (08 Marks)
- b. Explain counter type A/D converter with diagram. (08 Marks)

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15CS33

Third Semester B.E. Degree Examination, June/July 2018 Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Differentiate between structures and unions. (04 Marks)
b. Explain with example : i) insertion and ii) deletion in an array. (08 Marks)
c. Suppose each student in a class of 25 students is given 4 tests, assume the students are numbered from 1 to 25, and the test scores are assigned in the 25×4 matrix called SCORE. Suppose Base (SCORE) = 200, $w = 4$ and the programming language uses row-major order to store this 2D array, then find the address of 3rd test of 12th student i.e SCORE (12, 3). (04 Marks)

OR

- 2 a. List and explain any 4 functions supported in C for dynamic memory allocation with examples. (08 Marks)
b. Consider 2 polynomials $A(x) = 2x^{1000} + 1$ and $B(x) = x^4 + 10x^3 + 3x^2 + 1$ with a diagram show how these polynomials are stored in 1D array. (02 Marks)
c. With an example illustrate that "product of 2 sparse matrices may not be sparse". Also write a C function for matrix multiplication of 2 sparse matrices. (06 Marks)

Module-2

- 3 a. Write an algorithm to evaluate a postfix expression. Evaluate the following postfix expression $abc + * d c/-$ where $a = 5, b = 6, c = 2, d = 12, c = 4$. (06 Marks)
b. Write the algorithm for Ackermann function. Evaluate $A(1, 2)$ using ACKERMANN function. (04 Marks)
c. With a neat diagram explain ONE-WAY list representation of a priority queue. (06 Marks)

OR

- 4 a. Write a C program demonstrating the various stack operations, including cases for overflow and underflow of STACKS. (08 Marks)
b. Describe how you could model a maze, where 0 represents open paths and 1 represents barriers. What moves are permitted in the matrix model? Provide an example MAZE together with its allowable moves and table of moves. (08 Marks)

Module-3

- 5 a. Write a function for singly linked lists with integer data, to search an element in the list that is unsorted and a list that is sorted. (08 Marks)
b. Given 2 singly linked lists. LIST-1 and LIST-2. Write an algorithm to form a new list LIST-3 using concatenation of the lists LIST-1 and LIST-2. (08 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.

OR

- 6 a. Write a note on header linked list. Explain the widely used header lists with diagrams. (05 Marks)
- b. List out any 2 differences between doubly linked lists and singly linked list. (02 Marks)
- c. Illustrate with examples how to insert a node at the beginning, INSERT a node at intermediate position, DELETE a node with a given value. (09 Marks)

Module-4

- 7 a. Write a short note on threaded binary trees and state the rules to construct a threaded binary tree. (08 Marks)
- b. With separate functions illustrate recursive search and iterative search of a binary search tree. (08 Marks)

OR

- 8 a. Consider the following tree T in (Fig.8(a)) write the preorder, inorder, postorder for the tree T. Also find the depth of TREE in (Fig.Q8(a)). (04 Marks)

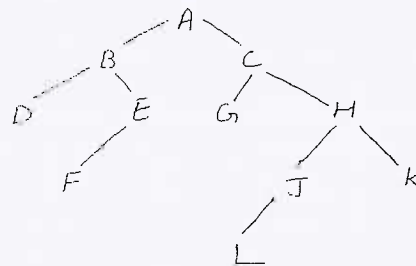


Fig.Q8(a)

- b. Write functions to illustrate "copying of binary trees", and "testing equality of binary trees". (08 Marks)
- c. Define complete binary tree. Illustrate with examples. (04 Marks)

Module-5

- 9 a. State and explain WARSHALLS algorithm with an example. (08 Marks)
- b. Write an algorithm for insertion sort. Apply insertion sort, showing the various passes to sort the array A, where A = [77, 33, 44, 11, 88, 22, 66, 55]. (08 Marks)

OR

- 10 a. Write a short note on hashing. Explain any 3 popular HASH functions. (08 Marks)
- b. What do you understand by the term file organization? Briefly summarize any 3 widely used file organization techniques. (08 Marks)

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15CS34

Third Semester B.E. Degree Examination, June/July 2018 Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define Addressing Mode. Give the details of different addressing modes. (08 Marks)
b. Describe the basic operational concepts between the processor and memory. (08 Marks)

OR

- 2 a. What is Subroutine? How to pass parameters to subroutines? Illustrate with an example. (08 Marks)
b. How to encode assembly instructions into 32-bit words? Explain with examples. (08 Marks)

Module-2

- 3 a. Define Bus Arbitration. With diagrams, explain the centralized bus arbitration mechanism. (08 Marks)
b. With the help of timing diagram, briefly discuss the main phases of SCSI bus involved in its operation. (08 Marks)

OR

- 4 a. With neat diagrams, explain how to interface printer to the processor. (08 Marks)
b. Explain the following methods of handling interrupts from multiple devices.
i) Interrupt nesting/priority structure ii) Daisy chain method. (08 Marks)

Module-3

- 5 a. Describe how to translate virtual address into physical address with diagram. (08 Marks)
b. Draw and explain the internal organisation of $2M \times 8$ asynchronous DRAM chip. (08 Marks)

OR

- 6 a. Describe any two mapping functions in cache. (08 Marks)
b. Describe the principles of magnetic disk. (08 Marks)

Module-4

- 7 a. Perform the operations on 5 – bit signed numbers using 2's complement system. Also indicate whether overflow has occurred. (06 Marks)
i) $(-10) + (-13)$ ii) $(-10) - (-13)$ iii) $(-2) + (-9)$.
b. Perform the multiplication of 13 and -6 using Booth algorithm and Bit – pair recoding method. (10 Marks)

OR

- 8 a. Perform the restoring division for $8 \div 3$ by showing all the steps. (06 Marks)
b. Explain the logic diagram of 4 – bit carry look ahead adder and its operations. (10 Marks)

Module-5

- 9 a. Draw and explain multiple bus organization along with its advantages. (10 Marks)
b. Write down the control sequence for the instruction Add $(R_3), R_1$ for single bus organization. (06 Marks)

OR

- 10 a. With block diagram, explain the general requirements and working of digital camera. (10 Marks)
b. Write the control sequence for an unconditional branch instruction. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $4^2+8=50$, will be treated as malpractice.

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15CS35

Third Semester B.E. Degree Examination, June/July 2018 UNIX and Shell Programming

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. Explain the architecture of UNIX operating system with a neat diagram. (06 Marks)
 b. What are internal and external commands in UNIX? Explain with any three examples in each type. (06 Marks)
 c. Explain the fields of /etc/passwd and /etc/shadow. (04 Marks)

OR

- 2 a. Write a note on man command with options. (06 Marks)
 b. Explain the following commands with examples :
 i) printf ii) passwd iii) date iv) who. (04 Marks)
 c. Describe with appropriate commands, how to display and set terminal characteristics. (06 Marks)

Module-2

- 3 a. Explain UNIX file system with the help of neat diagram. (06 Marks)
 b. Explain briefly absolute and relative pathnames with examples. (04 Marks)
 c. Briefly describe : i) HOME ii) PATH ii) WC iv) pwd. (06 Marks)

OR

- 4 a. Interpret the significance of seven fields of `ls-l` output. (06 Marks)
 b. Assuming the files current permission are `rw-r--r-x`, specify the `chmod` expression required to change the following using both absolute and relative method of assigning permissions.
 i) `rw-rwx-r-x`
 ii) `r-xr-x--x`
 iii) `r--r---w-` (06 Marks)
 c. Write a note on directory permissions with examples. (04 Marks)

Module-3

- 5 a. Explain with a neat diagram, three modes of Vi editor. (06 Marks)
 b. Explain briefly S(substitute command) in exmode of Vi editor. (04 Marks)
 c. Explain the following commands with examples :
 i) set ii) map iii) abbr (06 Marks)

OR

- 6 a. Define wild card. With examples, explain shells wild cards. (06 Marks)
 b. Explain the three standard files with respect to UNIX operating system. (06 Marks)
 c. Write a command for the following using `grep`
 i) To delete all blank lines from a file named Emp
 ii) To list only subdirectories in the current directory
 iii) To display lines containing pattern in file sample SIGSTOP or SIGTSTP
 iv) To display number of lines that does not contain pattern 'USA' in file times.txt. (04 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Define shell script. Write a menu driven shell script which displays :
- i) Current users of system
 - ii) List of files
 - iii) Today's date
 - iv) Process status
 - v) Contents of a file
- (06 Marks)
- b. Explain expr command applicable to computation and string functions. (06 Marks)
- c. Explain with example set and shift command in UNIX to manipulate positional parameters. (04 Marks)

OR

- 8 a. Explain the following filters with examples :
- i) head ii) tail iii) cut iv) paste.
- (08 Marks)
- b. Differentiate between hardlink and softlink in UNIX with examples. (04 Marks)
- c. Explain the following with examples :
- i) Umask ii) /dev/null and /dev/tty.
- (04 Marks)

Module-5

- 9 a. Explain three distinct phases of process creation. Explain how shell is created. (08 Marks)
- b. Explain the following commands with examples.
- i) Running jobs in background (& and nohup)
 - ii) Execute later (at and batch).
- (06 Marks)
- c. Write find command to locate from home directory.
- i) All files having inode number 9076
 - ii) All files named a.out and all C sources files and remove them interactively.
- (02 Marks)

OR

- 10 a. Explain string handling functions in Perl with examples. (06 Marks)
- b. Write a Perl program to find whether a given year is leap year or not using command line arguments. (04 Marks)
- c. Explain the following in Perl with examples. i) split ii) join. (06 Marks)

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10CS32

Third Semester B.E. Degree Examination, June/July 2018
Electronic Circuits

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting atleast TWO questions from each part.
2. Missing data, if any, may be suitably assumed.

PART - A

- 1 a. Example the concept of thermal Runaway in bipolar-junction transistors. (05 Marks)
 b. Calculate the values of the resistors R_C and R_E for the circuit shown in Fig.Q1(b) given that $R_1 = 5k\Omega$, $R_2 = 1k\Omega$, $\beta = 200$, $V_{CCQ} = 5V$ and $I_{CQ} = 2mA$. (assume silicon transistor and $I_1 \gg I_B$). (08 Marks)

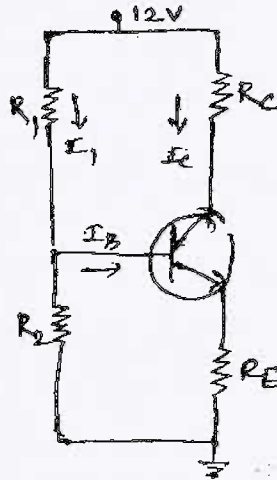


Fig.Q1(b)

- c. Briefly discuss the DC analysis and load line - analyses for the self bias configuration. (07 Marks)
- 2 a. Determine the value of operating point for the circuit shown in Fig.Q2(a) given that threshold voltage for the MOSFET is 2V and $I_{D(ON)} = 6mA$, for $V_{GS(ON)} = 5V$. (08 Marks)

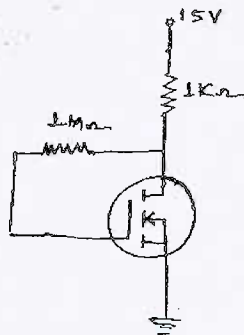


Fig.Q2(a)

- b. Explain with neat sketches the operation and characteristics of CMOS devices. (07 Marks)
 c. Write short note on handling of MOSFETS. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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- 3 a. Explain with neat diagrams the working operation types characteristics and parameters of Liquid Crystal Display Devices [LCD]. (10 Marks)
- b. Briefly discuss with necessary diagrams the basic operation of opto-couplers. (05 Marks)
- c. A photodiode has a noise current of 1fA responsivity figure of 0.5A/W calculate its noise equivalent power and detectivity. (05 Marks)
- 4 a. Draw the hybrid equivalent circuit of the transistor in all three configurations given that the hybrid parameters for the transistor are $h_{ie} = 1.5k\Omega$, $h_{fe} = 150$, $h_{re} = 1 \times 10^{-4}$ and $h_{oe} = 20 \mu mhos$. (10 Marks)
- b. What are cascade amplifiers? What are the advantages on overall frequency response of the amplifier? (05 Marks)
- c. Explain the effect of coupling and by pass capacitors on the low frequency response of the transistor based amplifier [SMPS]. (05 Marks)

PART – B

- 5 a. What are power amplifiers? How are they classified into different classes depending upon their mode of operation? (06 Marks)
- b. A class B amplifier provides a 20V peak output signal to 15Ω load. The system operates on a power supply of 25V. Determine the efficiency of the amplifier (08 Marks)
- c. The total harmonic distortion of an amplifier reduces from 10% to 1% on introduction of 10% negative feedback. Determine the open loop and closed loop gain values. (06 Marks)
- 6 a. Explain how RC and RL circuit acts as integrator and differentiator. (08 Marks)
- b. With a neat circuit diagram, explain the working operation of voltage-controlled oscillator. (06 Marks)
- c. What are multi-vibrators? Discuss briefly the principle of operation of a stable multi-vibrator with respect to IC 555. (06 Marks)
- 7 a. A regulated power supply provides a ripple rejection of $-80db$. If the ripple voltage in the unregulated input were 2V. Determine the output ripple (06 Marks)
- b. Explain with neat diagram and relevant waveforms the working operation of Boost switching voltage regulator. (08 Marks)
- c. Briefly discuss the important features and parameters of switched mode power supplies. (06 Marks)
- 8 a. Fig.Q8(a) shows a second order low pass filter built around a single Op-Amp. Calculate the values of R_1 , R_2 , C_1 , C_2 and R_3 . If the filter had a cut off frequency of 10KHz Q-factor of 0.707 and input impedance not less than $10K\Omega$. (08 Marks)

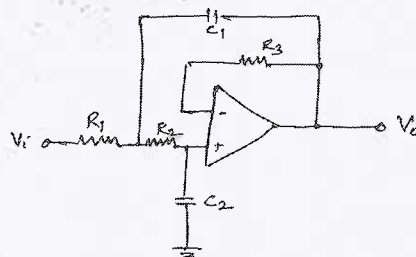


Fig.Q8(a)

- b. What is an absolute value circuit? Draw the circuit schematic of one such circuit configured around Op-Amp and briefly describe its functional principle. (08 Marks)
- c. Discuss briefly the performance parameters and applications of Op-Amps. (04 Marks)

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15CS33

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018

Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define data structures. Give its classification. (06 Marks)
b. Define structures with example. (04 Marks)
c. Define pointers. Give advantages and disadvantages of pointers. (06 Marks)

OR

- 2 a. Write a program to (i) reverse a string, (ii) concatenate two strings. (08 Marks)
b. Explain dynamic memory allocation in detail. (08 Marks)

Module-2

- 3 a. Define stack. Implement push and pop functions for stack using arrays. (08 Marks)
b. Write the postfix form of the following expression:
(i) $((6 + (3 - 2) * 4) \uparrow 5 + 7)$ (ii) $A \$ B \$ C * D$ (08 Marks)

OR

- 4 a. Define queues. Implement Qinsert and Qdelete function for queues using arrays. (08 Marks)
b. Define recursion. Write recursive program for (i) factorial of a number, (ii) tower of Hanoi. (08 Marks)

Module-3

- 5 a. Write the following functions for singly linked list: (i) Reverse the list (ii) Concatenate two lists. (08 Marks)
b. Write functions insert_front and delete_front using doubly linked list. (08 Marks)

OR

- 6 a. Write an algorithm to add two polynomials. (08 Marks)
b. Define sparse matrix. Give sparse matrix representation of linked list for given matrix. (08 Marks)

$$A = \begin{bmatrix} 0 & 0 & 4 & 0 & 0 \\ 6 & 5 & 0 & 0 & 0 \\ 0 & 3 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{bmatrix}$$

Module-4

- 7 a. What is a tree? Explain :
i) Binary tree
ii) Strictly binary tree
iii) Complete binary tree
iv) Skewed binary tree (08 Marks)
b. Given inorder sequence: DJGBHEAFKIC and postorder sequence: JGDHEBKIFCA. Construct binary tree and give preorder traversal. (08 Marks)

OR

- 8 a. Explain threaded binary tree in detail. (08 Marks)
 b. Write a function to insert an item into an ordered binary search tree (duplicate items are not allowed) (08 Marks)

Module-5

- 9 a. Define graph. Give adjacency matrix and adjacency linked list for the given weighted graph in Fig.Q9(a).

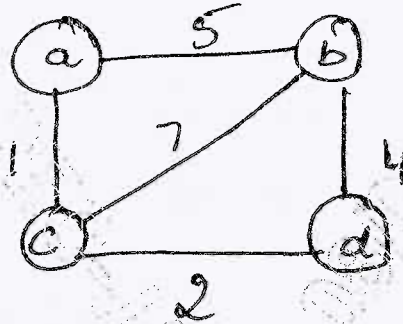


Fig.Q9(a)

- b. Write an algorithm for breadth first search and depth first search.

(08 Marks)

(08 Marks)

OR

- 10 a. Write an algorithm for Radix sort.
 b. Explain Hashing in detail.

(08 Marks)

(08 Marks)

CBCS Scheme

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15CS34

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018

Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. List the steps needed to execute the machine instruction Add LOCA, RO in terms of transfers between the processor and the memory along with some simple control commands. Assume that the instruction itself is stored in the memory at location INSTR and that this address is initially in register PC. The first two steps might be expressed as:
- Transfer the contents of Register PC to register MAR.
 - Issue a Read command to the memory and then wait until it has transferred the requested word into register MDR.
- Remember to include the steps needed to update the contents of PC from INSTR to INSTR+1 so that the next instruction can be fetched. (08 Marks)
- b. What is performance measurement? Explain the overall SPEC rating for the computer in a program suit. (08 Marks)

OR

- 2 a. With relevant figure define the little Endian and big Endian assignments. (04 Marks)
- b. Consider a computer that has a byte addressable memory organized in 32 bit words according to the big Endian scheme. A program reads ASCII characters entered at a keyboard and store them in successive byte location starting at location 1000. Show the contents of the two memory words at locations 1000 and 1004 after the name "Johnson" has been entered. (ASCII codes J = 4 AH, o = 6 FH, h = 68 H, n = 6 EH, S = 73 H) (04 Marks)
- c. Write about shift and rotate instruction with neat diagram and example of each. (08 Marks)

Module-2

- 3 a. With supporting diagram, explain the following with respect to interrupts:
- i) Vectored interrupts
 - ii) Interrupt Nesting
 - iii) Simultaneous requests. (06 Marks)
- b. Three devices A, B and C are connected to the bus of a computer. I/O transfers for all three devices use interrupt control. Interrupt nesting for devices A and B is not allowed, but interrupt requests from C may be accepted while either A or B is being services. Suggest different ways in which this can be accomplished in each of the following cases:
- i) The computer has one interrupt request line.
 - ii) Two interrupt request line, INTR1 and INTR2 are available with INTR1 having higher priority. Specify when and how interrupts are enabled and disable in each case. (06 Marks)
- c. Illustrate the tree structure of USB with diagram. (04 Marks)

OR

- 4 a. With a neat diagram, explain the centralized arbitration and distributed bus arbitration scheme. (08 Marks)
- b. With neat timing diagram illustrate the asynchronous bus data transfer during an input operation. Use handshake scheme. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and for equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Draw a diagram and explain the working of 16 Megabit DRAM chip configured as $2M \times 8$. (08 Marks)
 b. Describe organization of an $2M \times 32$ memory using $512K \times 8$ memory chips. (08 Marks)

OR

- 6 a. Discuss in detail the working of set associative mapped cache with two blocks per set with relevant diagram. (08 Marks)
 b. Define the following with respect to cache memory: (i) Valid bit, (ii) Dirty data, (iii) Stale data, (iv) Flush the cache. (04 Marks)
 c. A block-set associative cache consists of a total of 64 blocks divided into 4-blocks sets. The main memory contains 4096 blocks, each consisting of 128 words.
 i) How many bits are there in a main memory address?
 ii) How many bits are there in each of the TAG, SET and WORD fields? (04 Marks)

Module-4

- 7 a. Convert the following pairs of decimal numbers to 5-bit signed 2's complement binary numbers and add them. State whether or not overflow occurs in each case.
 i) 5 and 10 ii) -14 and 11 iii) -5 and 7 iv) -10 and -13 (04 Marks)
 b. Design the 16 bit carry look ahead adder using 4-bit adder. Also write the expression for C_{i+1} . (08 Marks)
 c. Draw the two n-bit number x and y to perform addition/subtraction. (04 Marks)

OR

- 8 a. With an example explain the Booths algorithm to multiply two signed operands. (08 Marks)
 b. Multiply each of the following pairs of signed 2's complement number using the Booth algorithm. (A = multiplicand and B = multiplier).
 i) $A = 010111$ and $B = 110110$
 ii) $A = 110011$ and $B = 101100$
 iii) $A = 110101$ and $B = 011011$
 iv) $A = 001111$ and $B = 001111$ (08 Marks)

Module-5

- 9 a. Discuss with neat diagram, the single bus organization of the data path inside a processor. (08 Marks)
 b. Write the sequence of control steps required for single bus structure for each of the following instructions.
 i) Add the contents of memory location NUM to register R1.
 ii) Add the contents of memory location whose address is at memory location NUM to register R1. (08 Marks)

OR

- 10 a. Discuss the microwave oven with neat block diagram. (08 Marks)
 b. Discuss the digital camera with neat block diagram. (08 Marks)

CBCS Scheme

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15CS35

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018

UNIX and Shell Programming

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List and explain features of UNIX operating system. (07 Marks)
 - b. Discuss internal and external commands, with suitable examples. (06 Marks)
- Write the outputs of the following commands :
- i) cal 8 1947
 - ii) echo 'Todays date is `date`'
 - iii) date + "Date is : %a/%h/%Y". (03 Marks)

OR

- 2 a. Explain "man" documentation, and its internal commands. (08 Marks)
- b. Describe command arguments and options with suitable examples. (04 Marks)
- c. How an ordinary user can become a super user and vice versa? Explain with suitable commands. (04 Marks)

Module-2

- 3 a. What is a file system? Explain Unix file system with neat diagram, also explain parent and child relationships with suitable examples. (08 Marks)
- b. What is pathname? List and explain types of path-names with an examples. (06 Marks)
- c. Write the command line to perform the followings :
 - i) Change current directory to home directory
 - ii) Change to parent of parent directory. (02 Marks)

OR

- 4 a. What are file permissions? Describe different ways of changing the file permissions. (07 Marks)
- b. Explain CP and Od commands with options. (06 Marks)
- c. Write the output for the following command lines.
 - i) mv filename dir_name
 - ii) ls | wc -w
 - iii) who | wc -l. (03 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and for equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. List and explain the different modes of Vi editor, also explain different ways of quitting Vi editor. (08 Marks)
- b. Discuss the following commands with respect to Vi editor.
i) b ii) w iii) | iv) G v) :l, 5w ab.txt vi) h vii) J viii) abbr. (08 Marks)

OR

- 6 a. What are wild cards characters? Explain each of them with suitable examples. (08 Marks)
- b. What is the purpose of grep? Explain grep with all options. (06 Marks)
- c. Explain tee command with an example. (02 Marks)

Module-4

- 7 a. Explain test command for handling strings. (04 Marks)
- b. Write a shell script using case to perform all arithmetic operations. (06 Marks)
- c. Explain for loop, also possible sources of argument list. (06 Marks)

OR

- 8 a. Explain cut command with all options, with examples. (05 Marks)
- b. What are links? How to create different types of links? And list their differences. (06 Marks)
- c. Discuss umask and default file permissions. (05 Marks)

Module-5

- 9 a. Discuss how to execute commands periodically with suitable example. (05 Marks)
- b. Explain find command in detail. (06 Marks)
- c. What is process? Explain different mechanisms of process creation. (05 Marks)

OR

- 10 a. Explain string handling functions in PERL. (07 Marks)
- b. Write a PERL programs check the given year is leap year or not. (07 Marks)
- c. Explain split function in PERL briefly. (02 Marks)

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CBCS Scheme

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15CS36

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Prove that for any three propositions p, q, r $[P \rightarrow (q \wedge r)] \Leftrightarrow [(p \rightarrow q) \wedge (p \rightarrow r)]$. Using truth table. (05 Marks)
- b. Establish the validity of the argument :

$$\begin{array}{l} p \rightarrow q \\ q \rightarrow (r \wedge s) \\ \neg r \vee (\neg t \vee u) \\ \hline p \wedge t \\ \hline \therefore u \end{array}$$
(06 Marks)
- c. Prove that for all integers 'k' and 'l', if 'k' and 'l' are both odd, then $k + l$ is even and kl is odd by direct proof. (05 Marks)

OR

- 2 a. Determine the truth value of each of the following quantified statements; the universe being the set of all non - zero integers. (05 Marks)
 - i) $\exists x, \exists y [xy = 1]$
 - ii) $\exists x, \forall y [xy = 1]$
 - iii) $\forall x, \exists y, [xy = 1]$
 - iv) $\exists x, \exists y [(2x + y = 5) \wedge (x - 3y = -8)]$.
 - v) $\exists x, \exists y [(3x - y = 17) \wedge (2x + 4y = 3)]$. (06 Marks)
- b. Find whether the following arguments are valid or not for which the universe is set of all triangles. In triangle XYZ, there is no pair of angles of equal measure. If the triangle has two sides of equal length, then it is isosceles. If the triangle is isosceles, then it has two angles of equal measure. Therefore triangle XYZ has no two sides of equal length. (05 Marks)
- c. If a proposition has truth value 1, determine all truth value assignments for the primitive propositions p, r, s for which the truth value of following compound proposition is 1. $[q \rightarrow \{(\neg p \vee r) \wedge \neg s\}] \wedge \{\neg s \rightarrow (\neg r \wedge q)\}$. (05 Marks)

Module-2

- 3 a. Prove by mathematical induction that, for every positive integer n, 5 divides $n^5 - n$. (05 Marks)
- b. For the Fibonacci sequence F_0, F_1, F_2, \dots prove that $F_n = \frac{1}{\sqrt{5}} \left[\left(\frac{1+\sqrt{5}}{2} \right)^n - \left(\frac{1-\sqrt{5}}{2} \right)^n \right]$. (06 Marks)
- c. Find the coefficient of :
 - i) $x^9 y^3$ in the expansion $(2x - 3y)^{12}$
 - ii) x^{12} in the expansion $x^3(1 - 2x)^{10}$. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 4 a. By mathematical induction. Prove that, for every positive integer n , the number $A_n = 5^n + 2 \cdot 3^{n-1} + 1$ is a multiple of 8. (05 Marks)
- b. How many positive integers 'n' can we form using the digits 3, 4, 4, 5, 5, 6, 7 if we want 'n' to exceed 5,000,000. (06 Marks)
- c. A certain question paper contains three parts A, B, C with four questions in part A, five questions in part B and six questions in part C. It is required to answer seven questions selecting atleast two questions from each part. In how many ways can a student select his seven questions for answering? (05 Marks)

Module-3

- 5 a. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \begin{cases} 3x-5, & \text{for } x > 0 \\ -3x+1, & \text{for } x \leq 0 \end{cases}$
- i) Determine $f\left(\frac{5}{3}\right)$, $f^{-1}(3)$, $f^{-1}([-5, 5])$.
- ii) Also prove that if 30 dictionaries contain a total of 61,327 pages, then atleast one of the dictionary must have atleast 2045 pages. (05 Marks)
- b. Prove that if $f: A \rightarrow B$ and $g: B \rightarrow C$ are invertible function then $g \circ f: A \rightarrow C$ is an invertible function and $(g \circ f)^{-1} = f^{-1} \circ g^{-1}$. (06 Marks)
- c. Let $A = \{1, 2, 3, 4, 5\}$. Define a relation R on $A \times A$ by $(x_1, y_1) R (x_2, y_2)$ if and only if $x_1 + y_1 = x_2 + y_2$.
- i) Determine whether R is an equivalence relation on $A \times A$
- ii) Determine equivalence class $[(1, 2)]$, $[(2, 5)]$. (05 Marks)

OR

- 6 a. Let f and g be functions from \mathbb{R} to \mathbb{R} defined by $f(x) = ax + b$ and $g(x) = 1 - x + x^2$. If $(g \circ f)(x) = 9x^2 - 9x + 3$. Determine a, b . (05 Marks)
- b. Let $A = \{1, 2, 3, 4, 6, 12\}$. On A define the relation R by aRb if and only if 'a' divides 'b'
- i) prove that R is a partial order on A ii) draw the Hasse diagram iii) write down the matrix of relation. (06 Marks)
- c. Consider the Poset whose Hasse diagram is given below. Consider $B = \{3, 4, 5\}$. Refer Fig.Q6(c). Find :
- i) All upper bounds of B
- ii) All lower bounds of B
- iii) The least upper bound of B
- iv) The greatest lower bound of B
- v) Is this a Lattice? (05 Marks)

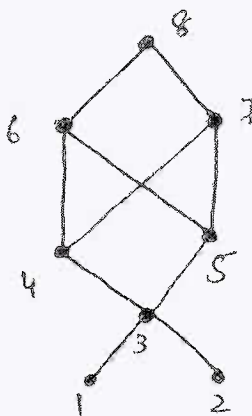


Fig.Q6(c)

2 of 3

Module-4

- 7 a. Out of 30 students in a hostel; 15 study history 8 study economics and 6 study geography. It is known that 3 students study all these subjects. Show that 7 or more students study none of these subjects. (05 Marks)
- b. Five teachers T_1, T_2, T_3, T_4, T_5 are to be made class teachers for five classes C_1, C_2, C_3, C_4, C_5 , one teacher for each class. T_1 and T_2 do not wish to become the class teachers for C_1 or C_2 , T_3 and T_4 for C_4 or C_5 and T_5 for C_3 or C_4 or C_5 . In how many ways can the teachers be assigned work without displeasing any teacher. (06 Marks)
- c. Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for $n \geq 2$. (05 Marks)

OR

- 8 a. Solve the recurrence relation $a_n - 3a_{n-1} = 5 \times 3^n$ for $n \geq 1$ given that $a_0 = 2$. (05 Marks)
- b. Let a_n denote the number of n-letter sequences that can be formed using the letters A, B and C such that non terminal A has to be immediately followed by a B. Find the recurrence relation for a_n and solve it. (06 Marks)
- c. Find the number of permutations of English letters which contain exactly two of the pattern car, dog, pun, byte. (05 Marks)

Module-5

- 9 a. Discuss Konigsberg bridge problem. (05 Marks)
- b. Let $G = G(V, E)$ be a simple graph with m edges and 'n' vertices. Then prove that :
 - i) $m \leq \frac{1}{2}n(n-1)$
 - ii) For a complete graph K_n , $m = \frac{1}{2}n(n-1)$ edges
 - iii) How many vertices and edges are there for $K_{4,7}$ and $K_{7,11}$. (06 Marks)
- c. Merge sort the list $-1, 7, 4, 11, 5, -8, 15, -3, -2, 6, 10, 3$. (05 Marks)

OR

- 10 a. Prove that a tree with 'n' vertices has $n - 1$ edges. (05 Marks)
- b. Obtain an optimal prefix code for the message LETTER RECEIVED indicate the code and weight. (06 Marks)
- c. Determine whether the following graphs are isomorphic or not. (05 Marks)

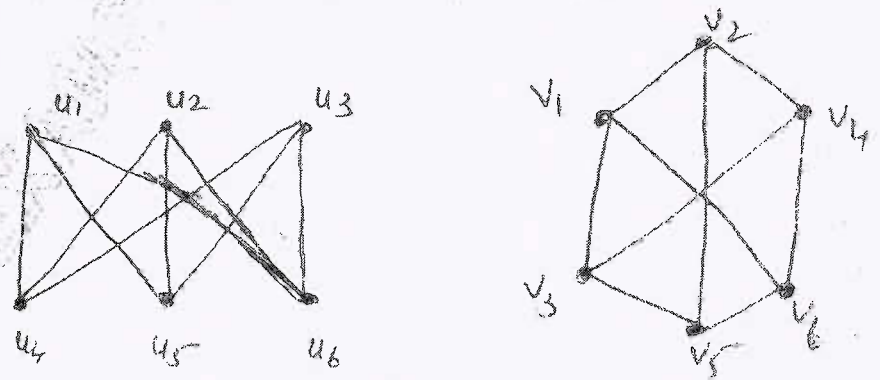


Fig.Q10(c)

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15CS36

Third Semester B.E. Degree Examination, June/July 2018 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Prove that for any propositions p, q, r the compound proposition :
 $\{p \rightarrow (q \rightarrow r)\} \rightarrow \{(p \rightarrow q) \rightarrow (p \rightarrow r)\}$ is a tautology. (06 Marks)
- b. Prove the following logical equivalence using the laws of logic:
 $(p \rightarrow q) \wedge [\neg q \wedge (r \vee \neg q)] \Leftrightarrow \neg (q \vee p)$. (05 Marks)
- c. Prove the following logical equivalence using the laws of logic:
 $[\neg p \wedge (\neg q \wedge r)] \vee (q \wedge r) \vee (p \wedge r) \Leftrightarrow r$. (05 Marks)

OR

- 2 a. Prove the validity of the arguments using rule of inference.

$$\begin{array}{l} (\neg p \vee \neg q) \rightarrow (r \wedge s) \\ r \rightarrow t \\ \neg t \\ \hline \therefore p \end{array}$$
 (05 Marks)
- b. Test the validity of the arguments using rule of inference.

$$\begin{array}{l} (\neg p \vee q) \rightarrow r \\ r \rightarrow (s \vee t) \\ \neg s \wedge \neg u \\ \neg u \rightarrow \neg t \\ \hline \therefore p \end{array}$$
 (05 Marks)
- c. Find whether the following argument is valid:

No Engineering student of 1st or 2nd semester studies logic
 Anil is an Engineering student who studies logic

\therefore Anil is not in second semester. (06 Marks)

Module-2

- 3 a. Prove by mathematical induction that :
 $1^2 + 3^2 + 5^2 + \dots + (2n-1)^2 = \frac{1}{3} n(2n-1)(2n+1)$. (05 Marks)
- b. A sequence $\{C_n\}$ is defined recursively by ,
 $C_n = 3C_{n-1} - 2C_{n-2}$ for all $n \geq 3$ with $C_1 = 5$ and $C_2 = 3$ as the initial conditions, show that
 $C_n = -2^n + 7$. (06 Marks)
- c. Determine the coefficient of xyz^2 in the expansion of $(2x - y - z)^4$. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 4 a. A certain question paper contains two parts A and B, each containing 4 questions. How many different ways a student can answer 5 questions by selecting atleast 2 questions from each part? (05 Marks)
- b. Prove by mathematical induction that, for every positive integer n , 5 divides $n^5 - n$. (06 Marks)
- c. How many numbers greater than 1000000 can be formed by using the digits 1, 2, 2, 2, 4, 4, 0? (05 Marks)

Module-3

- 5 a. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \begin{cases} 3x - 5 & \text{for } x > 0 \\ -3x + 1 & \text{for } x \leq 0 \end{cases}$$

Determine $f^{-1}(0), f^{-1}(1), f^{-1}(-1), f^{-1}(3), f^{-1}(-3), f^{-1}(-6)$, (06 Marks)

- b. Evaluate $S(5, 4)$. (05 Marks)
- c. Let f, g, h be the function form \mathbb{R} to \mathbb{R} defined by $f(x) = x + 2, g(x) = x - 2, h(x) = 3x$ for all $x \in \mathbb{R}$. Find $g \circ f, f \circ g, f \circ f, h \circ g, f \circ h$. (05 Marks)

OR

- 6 a. Let 'S' be the set of all non-zero integers and $A = S \times S$ on A, define the relation R by $(a, b)R(c, d)$ if and only if $ad = bc$. Show that 'R' is an equivalence relation. (06 Marks)
- b. Draw the Hasse diagram representing the positive divisors of 36. (06 Marks)
- c. Let $A = \{a, b, c, d, e\}$. Consider the partition $P = \{\{a, b\}, \{c, d\}, \{e\}\}$ of A. Find the equivalence relation inducing this partition. (04 Marks)

Module-4

- 7 a. In a survey of 260 college students, the following data were obtained. 64 had taken mathematics course, 94 had taken CS course, 58 had taken EC course, 28 had taken both Mathematics and EC course, 26 had taken both Mathematics and CS course, 22 had taken both CS and EC course, and 14 had taken all three types of course. Determine how many of these students had taken none of the three subjects. (05 Marks)
- b. Find the rook polynomial for the 3×3 board using expansion formula. (06 Marks)
- c. Solve the recurrence relation :
 $a_n + a_{n-1} - 6a_{n-2} = 0 \quad n \geq 2$, given $a_0 = -1$ and $a_1 = 8$. (05 Marks)

OR

- 8 a. An apple, a banana, a mango and an orange are to be distributed among 4 boys B_1, B_2, B_3, B_4 . The boys B_1 and B_2 do not wish to have an apple, the boy B_3 does not want banana or mango and B_4 refuses orange. In how many ways the distribution can be made so that no boy is displeased. (06 Marks)
- b. How many permutation of 1, 2, 3, 4, 5, 6, 7, 8 are not derangements? (04 Marks)
- c. The number of virus affected files in a system is 1000 (to start with) and this increases 250% every two hours. Use a recurrence relation to determine the number of virus affected files in the system after one day. (06 Marks)

Module-5

- 9 a. Define isomorphism. Show that the following graph are isomorphic to each other. Refer Fig.Q9(a). (06 Marks)

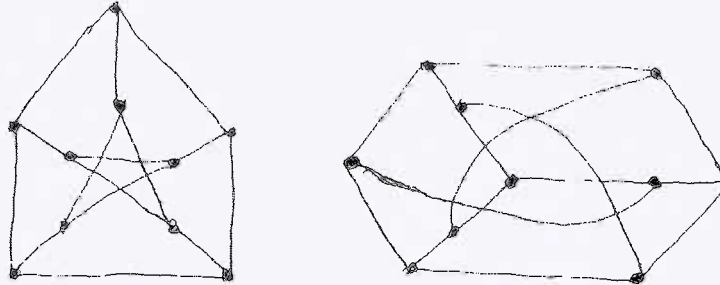


Fig.Q9(a)

- b. "A tree with 'n' vertices is having 'n - 1' edges". Prove the given statement. (05 Marks)
 c. Define complete graph, general graph and Bipartite graph with example for each. (05 Marks)

OR

- 10 a. For a graph with 'n' vertices and 'm' edges, if 'δ' is minimum, 'Δ' is maximum of the degree of vertices. Show that :

$$\delta \leq \frac{2m}{n} \leq \Delta \quad (05 \text{ Marks})$$

- b. Obtain the optimal prefix code for the message "ROAD IS GOOD". Indicate the code. (06 Marks)
 c. Apply the merge sort to the following given list of element. (05 Marks)
 {-1, 0, 2, -2, 3, 6, -3, 5, 1, 4}.

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10CS32

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
Electronic Circuits

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Draw the fixed bias circuit using BJT and derive the expressions for operating point. Mention its advantages and disadvantages. (08 Marks)
- b. For the circuit shown in Fig. Q1(b) determine the operating point. Given $\beta = 100$, $V_{BE} = 0.7V$ (04 Marks)

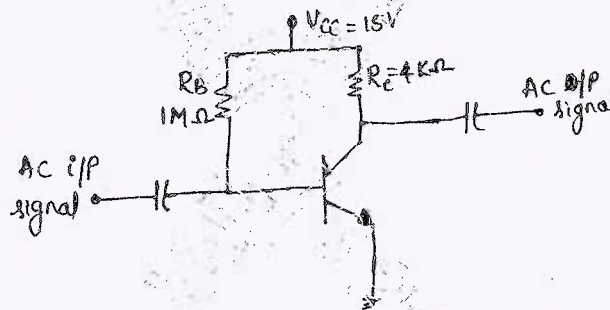


Fig. Q1(b)

- c. Explain the working of transistor as a switch and define delay time, rise time, storage time and fall time with respect to transistor switching. (08 Marks)
- 2 a. Explain the construction, operation and characteristics of N-channel E-MOSFET with sketches. (10 Marks)
- b. Briefly discuss the basic operation of CMOS inverter with a neat diagram. Mention two advantages of CMOS. (06 Marks)
- c. List the difference between JFET's and MOSFETS (any four). (04 Marks)
- 3 a. What is an optocouplers? Explain the parameters of optocouplers in brief. (06 Marks)
- b. Explain any six characteristics parameters of photo sensors. (06 Marks)
- c. Explain the basic operation and construction of LED and also discuss the different LED characteristics. (08 Marks)
- 4 a. Draw the generalized h-parameter model of a transistor based amplifier and derive the expression for :
 - i) Current gain
 - ii) Input Impedance
 - iii) Voltage gain
 - iv) Output admittance. (10 Marks)
- b. Discuss the effect of coupling and bypass capacitors on the low frequency response of the voltage divider BJT amplifier with relevant sketches. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

PART - B

- 5 a. Derive the expression for voltage gain, Input resistances and output resistance in case of voltage series feedback with a neat diagram. (10 Marks)
- b. What are the advantages of negative feedback? (06 Marks)
- c. An amplifier without feedback has a voltage gain of 100.
- i) Determine the gain of the amplifier with an introduction of 10% negative feedback.
- ii) Also find the feedback factor, if the gain required with feedback is 50. (04 Marks)
- 6 a. Explain the operation of monostable multi-vibrator with a neat diagram. (using BJT). (08 Marks)
- b. Explain RC low pass circuit and discuss the behavior of this circuit for step and pulse inputs. (08 Marks)
- c. Write a note on Barkhausen criterion. (04 Marks)
- 7 a. Explain the operation of buck regulator with relevant diagrams. (10 Marks)
- b. Design mains transformer with the following specifications,
Assume $B = 60,000$ lines/sq.inch.
Primary voltage : 220V, 50Hz
Secondary voltage : i) 5V at 1 A and efficiency is 90%
ii) 12 - 0 - 12V at 100mA efficiency is 90% (06 Marks)
- c. Define line regulation and load regulation for a regulated power supply. (04 Marks)
- 8 a. Define the following as referred to op-amp
- i) Bandwidth
- ii) CMRR
- iii) PSRR
- iv) Slew rate
- v) Open loop gain
- vi) Settling time. (06 Marks)
- b. Give a comparison between ideal op-amp with practical op-amp. (06 Marks)
- c. With neat figure and relevant waveform, explain the working of relaxation oscillator circuit using op-amp. (08 Marks)

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10CS35

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
Data Structures with C

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

1.
 - a. What are the various memory allocation techniques? Explain them with example. (06 Marks)
 - b. What is recursion? What are the various types of recursion explain with example. (06 Marks)
 - c. What is a magic square? What is the procedure given by coxeter to generate the magic square? (08 Marks)
2.
 - a. Point out the differences between malloc() and calloc() (04 Marks)
 - b. Write an algorithm to add two polynomials using abstract data type polynomial. (08 Marks)
 - c. Write an algorithm to search for an element in the sparse matrix represented as a triple. (08 Marks)
3.
 - a. Define stack, write an ADT of it. (04 Marks)
 - b. Convert the following infix to postfix notations.
 - i) $((A + (B - C) * D) ^ E + F)$
 - ii) $X ^ Y ^ Z - M + N + P / Q.$ (06 Marks)
 - c. Write an algorithm to implement queue full and queue empty functions for the non – circular queue. (10 Marks)
4.
 - a. What are linked lists? Point out its types and how a linked list is represented in 'C'? (04 Marks)
 - b. Write a 'C' functions to insert an item at the front end of the list. (04 Marks)
 - c. What are double – linked lists. Explain the procedure or a 'C' function how to insert a node at the front end and at the rear end. (10 Marks)
 - d. Point out any two differences between single and double link lists. (02 Marks)

PART – B

5.
 - a. Define the following : i) Strictly binary tree ii) Skewed tree
 iii) Complete binary tree iv) Binary search tree. (04 Marks)
 - b. Consider a binary tree, given in Fig.Q5(b).
 Write the preorder, postorder and inorder traversals of the binary tree of Fig.Q5(b) (06 Marks)

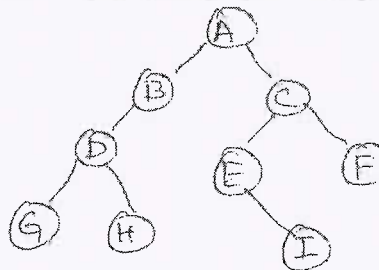


Fig.Q5(b)

- c. Write a 'C' functions to traverse the tree in inorder, preorder, and postorder level. (06 Marks)
- d. What are threaded binary trees? What are its types? How they are different from normal binary trees. (04 Marks)

- 6 a. What is a binary search tree? Explain how to insert an element in it. (05 Marks)
 b. Consider the following forest given in Fig. 6(b) and convert the forest into a binary tree. (05 Marks)

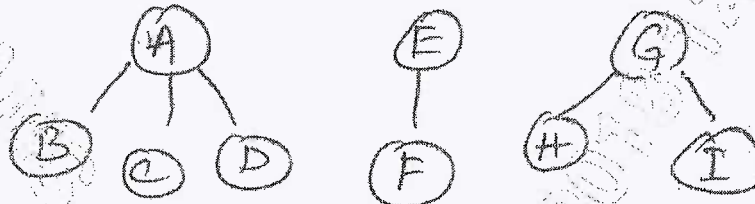


Fig. Q6(b)

- c. What is a selection tree? What are its types and explain them briefly. (04 Marks)
 d. What is an adjacency matrix and adjacency list explain both with an example. (06 Marks)
- 7 a. What is single ended and double ended priority queues? (03 Marks)
 b. What is a binomial heap? What are the types of binomial heaps? (06 Marks)
 c. What is a Fibonacci heap? What are the types of Fibonacci heaps? (06 Marks)
 d. What is a pairing heap? What are its types? (05 Marks)
- 8 a. What is an AVL tree? Write an algorithm to create an AVL tree. (10 Marks)
 b. What is a Red Black tree? What is the rank of a node in a red-black tree? How a red-black tree can be represented? (10 Marks)

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10CS36

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.*

PART – A

- 1
 - a. Explain basic data types available in C++, briefly with examples. (05 Marks)
 - b. What is inline function? Mention its advantages and also write a program to find cube of a given number. (05 Marks)
 - c. What is function overloading? Write a C++ program to find area of circle, triangle and rectangle by overloading the function area. (05 Marks)
 - d. Explain reference variable in C++. Also write a program to swap values of two given variables using reference variables. (05 Marks)

- 2
 - a. Explain how to achieve data hiding and encapsulation in C++, with suitable program. (08 Marks)
 - b. What are constructor and destructor? Can you overload constructor and destructor? Justify with suitable example. (08 Marks)
 - c. Explain static data member of a class. Also write a program to count the number of objects created. (04 Marks)

- 3
 - a. What is friend function? Write a program using bridge friend function swap to exchange the values of two variables and also display the result before and after swapping. (10 Marks)
 - b. Write a C++ program to add two complex numbers by overloading the operator + using member function. (05 Marks)
 - c. What is template function? Write a program using template function large to find the largest of three ints and three double numbers. (05 Marks)

- 4
 - a. How to achieve reusability in C++? Illustrate with an example. (10 Marks)
 - b. Explain the differences between the three visibility modes, with suitable example. (10 Marks)

PART – B

- 5
 - a. Explain how to pass arguments to base class constructors in multiple inheritance, with suitable example. (10 Marks)
 - b. Explain with the suitable diagram and program the virtual base class. (10 Marks)

- 6
 - a. What is runtime polymorphism? How to achieve it? Illustrate with an example program. (10 Marks)
 - b. Explain pure virtual function and abstract class with suitable programs. (10 Marks)

- 7
 - a. Explain with the neat diagram, the stream class hierarchy. (07 Marks)
 - b. Explain any five manipulators, with example. (06 Marks)
 - c. Explain briefly various file operations. (07 Marks)

- 8
 - a. What is exception? Explain briefly exception handling options. (10 Marks)
 - b. What is STL? Explain vector container briefly. (10 Marks)

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important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

CBCS Scheme

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15CS42

Fourth Semester B.E. Degree Examination, June/July 2018 Software Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What are the essential attributes of good software? Explain the key challenger facing in software engineering. (08 Marks)
- b. Explain four steps in spiral model of requirements elicitation and analysis process. And why the understanding of requirements from stake holders is difficult task? Explain. (08 Marks)

OR

- 2 a. What is a software process model? Explain the types of software process models. (05 Marks)
- b. What is requirement specification? Explain various ways of writing system requirements. (06 Marks)
- c. Explain the different checks to be carried during requirement validation process. (05 Marks)

Module-2

- 3 a. Draw and explain use case modeling and sequence diagram for patient information system. (10 Marks)
- b. With a diagram, explain the phases in the Rational Unified Process (RUP). (06 Marks)

OR

- 4 a. Draw and explain state diagram of a microwave oven. (07 Marks)
- b. What is design pattern? Explain four essential elements of design pattern. (05 Marks)
- c. Explain the general models of open source licenses. (04 Marks)

Module-3

- 5 a. What is test driven development? With neat diagram, explain test driven development process. (08 Marks)
- b. With neat diagram, explain six stages of acceptance testing process. (08 Marks)

OR

- 6 a. With neat diagram, explain the software evolution process. (05 Marks)
- b. Explain three different types of software maintenance. (03 Marks)
- c. Draw a chart showing relative business value and system quality of legacy system management and explain four clusters of systems. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. For the set of tasks shown below draw the project scheduling using,
 i) Activity bar chart
 ii) Staff allocation chart

(10 Marks)

Task	Duration (Days)	Dependencies
T ₁	10	-
T ₂	15	-
T ₃	15	T ₁ (M1)
T ₄	10	-
T ₅	10	T ₂ , T ₄ (M3)
T ₆	5	T ₁ , T ₂ (M4)
T ₇	20	T ₁ (M1)
T ₈	25	T ₄ (M2)
T ₉	15	T ₃ , T ₆ (M5)
T ₁₀	15	T ₇ , T ₈ (M6)
T ₁₁	10	T ₉ (M7)
T ₁₂	10	T ₁₀ , T ₁₁ (M8)

- b. Explain briefly the algorithmic cost modeling and write the difficulties.

(06 Marks)

OR

- 8 a. Write any four product and process standards.
 b. Explain briefly the software review process.
 c. Explain briefly the process of product measurement.

(04 Marks)

(06 Marks)

(06 Marks)

Module-5

- 9 a. State and explain the principles of agile methods.
 b. Write a note on pair programming.
 c. List the advantages of SCRUM used in a telecommunication software development environment.

(05 Marks)

(06 Marks)

(05 Marks)

OR

- 10 a. Explain the practices involved in the extreme programming.
 b. How the agile methods are scaled? State the coping of agile methods for large system engineering.

(10 Marks)

(06 Marks)

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15CS43

Fourth Semester B.E. Degree Examination, June/July 2018 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Write an algorithm to find the maximum element in an array of n element. Give the mathematical analysis of this non-recursive algorithm. (06 Marks)
- b. Explain the asymptotic notations BigO, Big Ω and big theta used to compare orders of growth of an algorithm. (06 Marks)
- c. Explain with an example how a new variable count introduced in a program can be used to find the number of steps needed by a program to solve a particular problem instance. (04 Marks)

OR

- 2 a. Write a recursive function to find and print all possible permutations of a given set of n elements. (05 Marks)
- b. Solve the recurrence relation : $M(n) = 2M(n - 1) + 1$. Take $M(1) = 1$. $M(n)$ is given for $n > 1$. (05 Marks)
- c. Define algorithm. What are the criteria that an algorithm must satisfy? (06 Marks)

Module-2

- 3 a. Write a function to find the maximum and minimum elements in a given array of n elements by applying the divide and conquer technique. (06 Marks)
- b. Explain the divide and conquer technique. Give the general algorithm DAndC(P)[Where P is the problem to be solve] to illustrate this technique. (04 Marks)
- c. Apply source removal method to obtain topological sort for the given graph in Fig.Q3(c). (06 Marks)

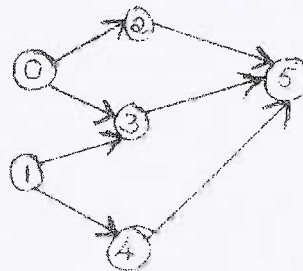


Fig.Q3(c)

OR

- 4 a. Explain the merge sort algorithm. Illustrate with an example and give the worst case efficiency of merge-sort. (08 Marks)
- b. Apply quick sort algorithm to the following set of numbers. (08 Marks)
65, 70, 75, 80, 85, 60, 55, 50, 45.

Module-3

- 5 a. Apply greedy method to obtain an optimal solution to the knapsack problem given $M = 60$, $(w_1, w_2, w_3, w_4, w_5) = (5, 10, 20, 30, 40)$ $(p_1, p_2, p_3, p_4, p_5) = (30, 20, 100, 90, 160)$. Find the total profit earned. **(04 Marks)**
- b. Explain Huffman algorithm. With an example show the construction of Huffman tree and generate the Huffman code using this tree. **(06 Marks)**
- c. Apply Prim's algorithm to obtain a minimum spanning tree for the given weighted connected graph. [Fig.Q5(c)]. **(06 Marks)**

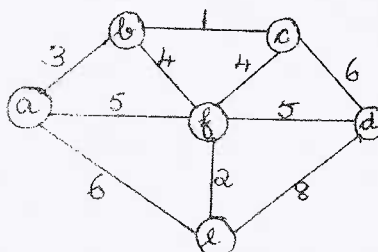


Fig.Q5(c)

OR

- 6 a. Explain the bottom up heap construction algorithm with an example. Give the worst case efficiency of this algorithm. **(08 Marks)**
- b. Apply single source shortest path problem assuming vertex a as source. [Refer Fig.Q6(b)]. **(08 Marks)**

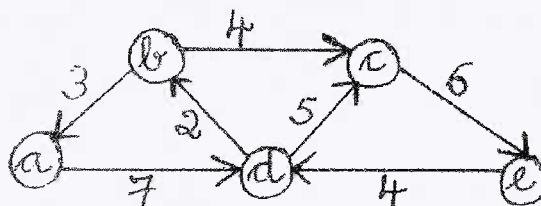


Fig.Q6(b)

Module-4

- 7 a. Explain multistage graph with an example. Write multistage graph algorithm using backward approach. **(08 Marks)**
- b. Apply Floyd's algorithm to solve all pair shortest path problem for the graph given below in Fig.Q7(b). **(08 Marks)**

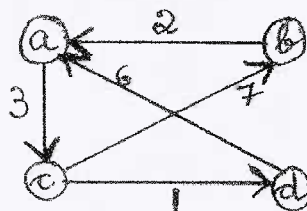


Fig.Q7(b)

OR

- 8 a. Explain Bellman Ford al to find shortest path from single source to all destinations for a directed graph with negative edge cost. (08 Marks)
 b. Apply Warshall's algorithm to the digraph given below in Fig.Q8(b) and find the transitive closure. (08 Marks)

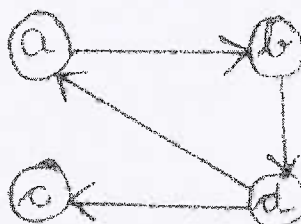


Fig.Q8(b)

Module-5

- 9 a. Apply backtracking method to solve subset-sum problem for the instance $d = 30$ and $S = \{5, 10, 12, 13, 15, 18\}$. Give all possible solutions. (08 Marks)
 b. Explain how travelling salesman problem can be solved using branch and bound technique. (06 Marks)
 c. Define deterministic and non deterministic algorithms. (02 Marks)

OR

- 10 a. What is Hamiltonian cycle? Explain the algorithm to find the Hamiltonian cycle in a given connected graph. Write the functions used for generating next vertex and for finding Hamiltonian cycles. (09 Marks)
 b. Apply the best-first branch-and-bound algorithm to solve the instance of the given job assignment problem. (07 Marks)

	Job1	Job2	Job3	Job4	
(9	2	7	8	Person a
	6	4	3	7	Person b
	5	8	1	8	Person c
	7	6	9	4	Person d

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15CS44

Fourth Semester B.E. Degree Examination, June/July 2018 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is a microprocessor? With a neat diagram explain the internal block diagram of 8086 microprocessor along with functions of each block and registers. (10 Marks)
- b. What is an addressing mode? List the addressing modes of 8086 μ p with one example each (any six modes). (06 Marks)

OR

- 2 a. What are the assembler directives? Explain the following assembler directives:
(i) DB (ii) Assume (iii) OFFSET (iv) PTR (04 Marks)
- b. What is a flag and flag register? Explain the format of flag register with a suitable example. (06 Marks)
- c. Write an assembly level program (ALP) to sort a given set of 'n' 16-bit numbers in descending order. Using Bubble sort algorithm to sort given elements. (06 Marks)

Module-2

- 3 a. Explain the following instructions with a suitable example:
(i) MOV (ii) PUSH (iii) LEA (iv) SHR
(v) ROL (vi) CMP (vii) DAA (viii) TEST. (08 Marks)
- b. What is an interrupt? Explain various types with an interrupt vector table. (08 Marks)

OR

- 4 a. Explain the following instructions with a suitable example:
(i) XLAT (ii) RCR (iii) AAA (iv) MUL
(v) DIV (vi) LOOP (vii) ROL (viii) OR (08 Marks)
- b. Explain rotate instructions with an example. (08 Marks)

Module-3

- 5 a. With example, explain how to identify overflow and underflow using flags in a flag register for performing an arithmetic operation on 16-bit numbers. (08 Marks)
- b. Explain 74138 decoder configuration to enable the memory address 08000H to 0FFFFH to connect four 8K RAMS. (08 Marks)

OR

- 6 a. Briefly explain the control word format of 8255 IC in I/O mode and BSR mode. Find the control word if $P_A = \text{out}$, $P_B = \text{in}$, $P_{C0} - P_{C3} = \text{in}$ and $P_{C4} - P_{C7} = \text{out}$. Use port address of 300H - 303H for the 8255 chip. Then get data from port A and send it to port B. (08 Marks)
- b. Write an assembly level program (ALP) to read P_B and check number of one's in a 8-bit data as P_A and display FFh on P_A if it is even parity else 00h on Port A (P_A) if it is an odd parity. (08 Marks)

Module-4

- 7 a. Compare CISC with RISC. (05 Marks)
b. Explain registers used under various modes. (05 Marks)
c. Explain ARM core data flow model with a neat diagram. (06 Marks)

OR

- 8 a. Explain the architecture of a typical embedded device based in ARM core with a neat diagram. (08 Marks)
b. Explain the various fields in the current program status register. (08 Marks)

Module-5

- 9 a. Explain the following instructions of ARM processor with suitable example:
(i) MVN (ii) RSB (iii) ORR (iv) MLA
(v) SMULL (vi) LDR (vii) SWP (viii) SWPB (08 Marks)
b. Explain various formats of ADD instructions based on operands of ARM7 processor. (04 Marks)
c. If $r_5 = 5$, $r_7 = 8$ and using the following instruction, write values of r_5 , r_7 after execution
MOV $r_7, r_5, LSL \# 2$ (04 Marks)

OR

- 10 a. Explain software interrupt instruction of ARM processor. (06 Marks)
b. Explain various types of SWAP instructions with syntax and example. (06 Marks)
c. What are the silent features of ARM instruction set? (04 Marks)

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15CS45

Fourth Semester B.E. Degree Examination, June/July 2018

Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. State the important features of Object Oriented programming paradigm. (08 Marks)
b. Write a C++ program to get employees details (empno, ename, bsalary(initialized to 1000 by constructor) and allowance) of Employee class through keyboard using the method Getdata() and display them using the method Dispdata() on console in the format empno, ename, bsalary, allowance. (08 Marks)

OR

- 2 a. Describe function Prototype, with an example. (04 Marks)
b. Explain namespace, with an example. (04 Marks)
c. Define Function Overloading and write a C++ program for finding areas of circle ($\pi * r * r$), rectangle ($l * b$) and square ($x * x$) by getting r, l, b and x through keyboard and printing the areas on console using the method Area() applying the concept of function overloading. (08 Marks)

Module-2

- 3 a. State the features used in C++ which are eliminated in Java. Why? (04 Marks)
b. Discuss briefly the concept of byte code in Java. (04 Marks)
c. Explain the structure of a Java program and its keywords with an example. (08 Marks)

OR

- 4 a. How arrays are defined in Java? Explain with an example. (04 Marks)
b. Elucidate how Java is a platform independent language, with neat sketches. (06 Marks)
c. Write a Java program to print factorial of the number 'n' using for loop. (06 Marks)

Module-3

- 5 a. Explain package and its types and import command in Java with examples. (08 Marks)
b. Write a Java program to define an interface called Area which contains method called Compute() and calculate the areas of rectangle ($l * b$) and triangle ($1/2 * b * h$) using classes Rectangle and Triangle. (08 Marks)

OR

- 6 a. Define the role of Exception handling in software development. (02 Marks)
b. Write a Java program for illustrating the exception handling when a number is divided by zero and an array has a negative index value. (06 Marks)
c. Elucidate the concept of inheritance and its classifications in Java with sketches. (08 Marks)

Module-4

- 7 a. Define the concept of multithreading in Java and explain the different phases in the life cycle of a thread, with a neat sketch. (08 Marks)
b. Discuss briefly Synchronization in Java (2). (02 Marks)
c. Write an example Program for implementing static synchronization in Java. (06 Marks)

OR

- 8 a. Elucidate the two ways of making a class threadable, with examples. (08 Marks)
b. Describe the delegation event model and explain what happens internally at a button click. (08 Marks)

Module-5

- 9 a. Briefly explain Applets. (03 Marks)
b. Elucidate Lucidly the skeleton of an Applet. (05 Marks)
c. Write a Java program to play an audio file using Applet. (08 Marks)

OR

- 10 a. Write the advantages of swing over AWT. (04 Marks)
b. Write a brief note on Containers in swing. (04 Marks)
c. Write a swing program for displaying anyone of the options. C , C++ , Java, Php through the selection of Combo box by clicking show button. (08 Marks)

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10CS45

Fourth Semester B.E. Degree Examination, June/July 2018
Microprocessors

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Define microprocessor. Briefly discuss evolution of microprocessors. (06 Marks)
- b. Draw and explain the block diagram of computer system showing address, data and control bus structure. (06 Marks)
- c. Why 8086 memory is divided into segments? Explain the use of Segment, Pointer and Index registers. (08 Marks)

- 2 a. Explain protected mode addressing of 80286 through Core2 64-bit processors. (12 Marks)
- b. Explain with an example, various program memory addressing modes (any 4 addressing modes). (08 Marks)

- 3 a. Explain the coding format of MOV instruction. Also generate opcode for the following instruction :
 MOV WORD PTR [BX + 1000H], 1234H (10 Marks)
- b. Explain the following instructions with an example for each :
 (i) LES (ii) MOVS (iii) XLAT (iv) MUL (v) CBW (05 Marks)
- c. Explain the following assembler directives with an example for each :
 (i) DB (ii) ORG (iii) ASSUME (iv) PROC (v) USES (05 Marks)

- 4 a. Explain the following instructions with example for each :
 (i) DAA (ii) AAS (iii) AAM (iv) WAIT (v) BOUND (10 Marks)
- b. Write an 8086 assembly language program to separate odd and even numbers in an array. (06 Marks)
- c. Write an 8086 assembly language program to read a key from the keyboard and store its hexadecimal value in memory location TEMP (Use IF...ELSE statements). (04 Marks)

PART – B

- 5 a. What is an inline assembly? Explain the basic rules of the same for 16-bit DOS applications. (08 Marks)
- b. Differentiate between :
 (i) Assembler and Linker
 (ii) Public and EXTRN
 (iii) Macros and Procedures (06 Marks)
- c. Write an 8086 ALP to find largest of 3 numbers. (06 Marks)

- 6 a. Explain the functions of following pins of 8086 microprocessor :
 (i) READY (ii) $\overline{\text{BHE}}$ (iii) ALE (iv) $\overline{\text{M}/\overline{\text{IO}}}$ (v) NMI (vi) HOLD (06 Marks)
- b. Draw and explain minimum mode memory read machine cycle of 8086. (06 Marks)
- c. With an internal block diagram, explain 8288 bus controller. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Briefly explain the following memory devices :
(i) ROM (ii) PROM (iii) EPROM (iv) EEPROM (v) SRAM (vi) DRAM
(06 Marks)
- b. Design an interface between 8086 MPU and two chips of 16k×8 EPROM and two chips of 32k×8 RAM, Select the starting address of EPROM suitably. (08 Marks)
- c. Differentiate between I/O - mapped - I/O and memory-mapped - I/O. (06 Marks)
- 8 a. Explain different I/O modes of operation of 8255. (06 Marks)
- b. With an internal block diagram, explain 8254 Programmable Interval Timer. (06 Marks)
- c. Explain the structure of 8086 interrupt vector table with a neat diagram. (08 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Management and Entrepreneurship for IT Industry

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the various roles of a manager. (06 Marks)
b. Explain the contribution of FW Taylor to the theory of management. (10 Marks)

OR

- 2 a. Explain the steps involved in planning, and give the importance and purpose of planning process. (12 Marks)
b. What are MBO and MBE? Explain. (04 Marks)

Module-2

- 3 a. Explain types of leaders or leadership styles. (06 Marks)
b. Explain steps in controlling. (10 Marks)

OR

- 4 a. Explain Maslow's hierarchy theory. (10 Marks)
b. Explain the following: (i) Cognitive evaluation theory (06 Marks)
(ii) Herzberg (two factor theory)

Module-3

- 5 a. Differentiate between entrepreneur, intrapreneur and manager. (04 Marks)
b. Explain various stages in entrepreneurial process. (12 Marks)

OR

- 6 a. List some of the most commonly attributed reasons for the lack of entrepreneurship in India. (12 Marks)
b. Write short notes on: (i) Procrastination (ii) Tying your dreams to age (04 Marks)

Module-4

- 7 a. Explain the phases of project identification with its sources. (04 Marks)
b. List out various contents of project report. (12 Marks)

OR

- 8 a. Explain various factors to be considered for selection of a project. (06 Marks)
b. Give the meaning of project appraisal. (10 Marks)

Module-5

- 9 a. Explain the following: (i) NSIC (ii) DIC (iii) NIMSMIET (iv) NIESBUD (v) KSFC (10 Marks)
b. Justify WTO and its impact on Small Scale Industries in India. (06 Marks)

OR

- 10 a. What is TECSOK? Explain the services offered by TECSOK. (10 Marks)
b. Explain the aims and objectives of KIADB. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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15CS/15

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Computer Networks

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain HTTP messages. (08 Ma)
b. Explain web caching with diagram. (08 Ma)

OR

- 2 a. Explain FTP with its commands and replies. (08 Ma)
b. Explain SMTP. (04 Ma)
c. Explain DNS resource record. (04 Ma)

Module-2

- 3 a. Explain Sender's view of sequence numbers and its operation in Goback N protocol. (08 Ma)
b. Draw TCP segment structure and explain. (08 Ma)

OR

- 4 a. Explain 3 way handshake and closing a TCP connection. (08 Ma)
b. Explain the causes and costs of congestion. (08 Ma)

Module-3

- 5 a. With diagram explain router architecture. (08 Ma)
b. Explain IP fragmentation. (08 Ma)

OR

- 6 a. Explain distance vector algorithm. (08 Ma)
b. Explain 4 types of hierarchical OSPF routers. (08 Ma)
c. Compare link state with distance vector algorithm. (08 Ma)

Module-4

- 7 a. Explain components of a cellular network architecture. (08 Ma)
b. Explain direct routing of a mobile node. (08 Ma)

OR

- 8 a. Explain steps of handoff a mobile user. (08 Ma)
b. Explain HLR, VLR, home address, care-of-address. (08 Ma)

Module-5

- 9 a. With diagram, explain naïve architecture for audio/video streaming. (08 Ma)
b. Explain audio compression in internet. (08 Ma)

OR

- 10 a. With diagram, explain interaction between client and server using F (08 Ma)
b. Explain how streaming from streaming server to a media player is (08 Ma)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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CBCS SCHEME

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15CS53

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Database Management System

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the responsibilities of the DBA and Database Designer? (06 Marks)
- b. With neat diagram, explain "three schema Architecture". (05 Marks)
- c. Discuss the different types of user friendly interfaces and the types of user who typically use each. (05 Marks)

OR

- 2 a. Explain with block diagram the different phases of database design. (08 Marks)
- b. Draw an ER-Diagram of movie database. Assume your own entities (minimum 4) attributes and relationships. (08 Marks)

Module-2

- 3 a. Discuss the characteristics of relations. (06 Marks)
- b. Outline the steps to convert the basic ER Model to relational Database schema. (06 Marks)
- c. Define the following: (04 Marks)
 - i) Relation state
 - ii) Relation schema
 - iii) Arity
 - iv) Domain.

OR

- 4 a. Discuss the various types of set theory operations with example. (08 Marks)
- b. Consider the two tables, show the results of the following:

T ₁		
A	B	C
10	a	5
15	b	8
25	a	6

T ₂		
P	Q	R
10	b	6
25	c	3
10	b	5

i) $T_1 \bowtie_{T_1.B=T_2.Q} T_2$

ii) $T_1 \bowtie_{T_1.A=T_2.P} T_2$

iii) $T_1 \bowtie_{(T_1.A=T_2.P) \text{ AND } (T_1.C=T_2.R)} T_2$

iv) $T_1 - T_2$

(08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. How does SQL implement the entity integrity constraints of the relational data model? Explain with an example. (04 Marks)
- b. Discuss: i) Shared variables ii) Communication variables. (06 Marks)
- c. Explain with examples in SQL:
- Drop command
 - Delete command
 - Update command. (06 Marks)

OR

- 6 a. With program segment, explain retrieving of tuples with embedded SQL in C. (06 Marks)
- b. Consider the following tables:
works (Pname, Cname, Salary)
lives (Pname, Street, City)
located-In (Cname, City)
write the following queries in SQL:
- List the names of the people who work for the company 'Wipro' along with the cities they live in.
 - Find the names of the persons who do not work for 'Infosys'.
 - Find the people whose salaries are more than that of all of the 'oracle' employees.
 - Find the persons who works and lives in the same city. (10 Marks)

Module-4

- 7 a. What do you mean by closure of attribute? Write an algorithm to find closure of attribute. (06 Marks)
- b. Explain any two informal Quality measures employed for a relation schema design. (04 Marks)
- c. Given below are two sets of FDs for a relation R (A, B, C, D, E). Are they equivalent?
- $A \rightarrow B$, $AB \rightarrow C$, $D \rightarrow AC$, $D \rightarrow E$
 - $A \rightarrow BC$, $D \rightarrow AE$ (06 Marks)

OR

- 8 a. What do you mean by multivalued dependency? Explain the 4NF with example. (06 Marks)
- b. Suggest and explain three different techniques to achieve 4NF using suitable example. (04 Marks)
- c. Consider the following relation for CARSALE (CAR-NO, Date-Sold, Salesman No, Commission, Discount)
Assume a car can be sold by multiple salesman and hence primary key is {CAR_NO, Salesman_No}.
Additional dependencies are
 $Date_Sold \rightarrow Discount$
 $Salesman_No \rightarrow Commission$
- Is this relation in 1NF, 2NF or 3NF? Why or why not?
 - How would you normalize this completely? (06 Marks)

Module-5

- 9 a. Discuss the ACID properties of a transaction. (04 Marks)
- b. What are the anomalies occur due to interleave execution? Explain them with example. (06 Marks)

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c. Consider the three transactions T_1 , T_2 and T_3 and schedules S_1 and S_2 given below. Determine whether each schedule is serializable or not? If a schedule is serializable write down the equivalent serial schedule (S).

T_1 : $R_1(x)$; $R_1(z)$; $W_1(x)$;

T_2 : $R_2(x)$; $R_2(y)$; $W_2(z)$; $W_2(y)$;

T_3 : $R_3(x)$; $R_3(y)$; $W_3(y)$;

S_1 : $R_1(x)$; $R_2(z)$; $R_1(z)$; $R_3(x)$; $R_3(y)$; $W_1(x)$; $W_3(y)$; $R_2(y)$; $W_2(z)$; $W_2(y)$;

S_2 : $R_1(x)$; $R_2(z)$; $R_3(x)$; $R_1(z)$; $R_2(y)$; $R_3(y)$; $W_1(x)$; $W_2(z)$; $W_3(y)$; $W_2(y)$;

(06 Marks)

OR

- 10 a. Describe the problems that occur when concurrent execution uncontrolled. Give examples. (06 Marks)
- b. What is two phase locking? Describe with the help of an example. (04 Marks)
- c. What is Deadlock? Consider the following sequences of actions listed in the order they are submitted to the DBMS.

Sequence S_1 : $R_1(A)$; $W_2(B)$; $R_1(B)$; $R_3(C)$; $W_2(C)$; $W_4(B)$; $W_3(A)$

Draw waits-for graph in case of Deadlock situation.

(06 Marks)

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15CS54

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

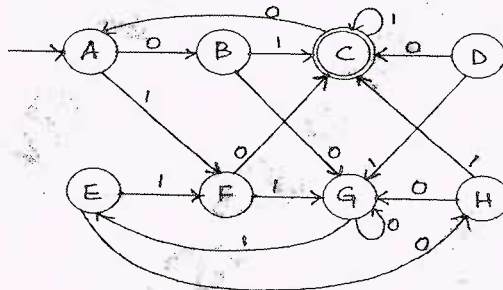
- 1 a. Define the following with example :
 i) String ii) Language iii) Alphabet iv) DFSM. (08 Marks)
 b. Design a DFSM to accept each of the following languages :
 i) $L = \{W \in \{0, 1\}^* : W \text{ has } 001 \text{ as a substring}\}$
 ii) $L = \{W \in \{a, b\}^* : W \text{ has even number of a's and even number of b's}\}$. (08 Marks)

OR

- 2 a. Define NDFSM. Convert the following NDFSM to its equivalent DFSM. (08 Marks)

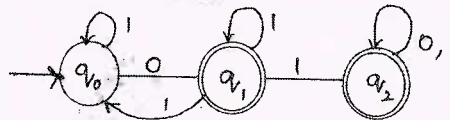


- b. Minimize the following DFSM. (08 Marks)



Module-2

- 3 a. Define Regular expression and write Regular expression for the following language.
 i) $L = \{a^{2n} b^{2m} \mid n \geq 0, m \geq 0\}$ (08 Marks)
 ii) $L = \{a^n b^m \mid m \geq 1, n \geq 1, nm \geq 3\}$.
 b. Obtain the Regular expression for the following FSM. (08 Marks)



OR

- 4 a. Define a Regular grammar. Design regular grammars for the following languages.
 i) Strings of a's and b's with at least one a.
 ii) Strings of a's and b's having strings without ending with ab.
 iii) Strings of 0's and 1's with three consecutive 0's. (08 Marks)
 b. State and prove pumping theorem for regular languages. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Define context free grammar. Design a context free grammar for the languages. (08 Marks)
- i) $L = \{0^m 1^m 2^n \mid m \geq 0, n \geq 0\}$ ii) $L = \{a^i b^j \mid i \neq j, i \geq 0, j \geq 0\}$
- iii) $L = \{a^n b^{n-3} \mid n \geq 3\}$.
- b. Consider the grammar G with production.
- $S \rightarrow AbB$
 $A \rightarrow aA \mid \epsilon$ (08 Marks)
 $B \rightarrow aB \mid bB \mid \epsilon$
- Obtain leftmost derivation, rightmost derivation and parse tree for the string aaabab.

OR

- 6 a. Define a PDA. Obtain a PDA to accept
 $L = \{a^n b^n \mid n \in \{a, b\}^*\}$. Draw the transition diagram. (08 Marks)
- b. Convert the following grammar into equivalent PDA. (08 Marks)
- $S \rightarrow aABC$
 $A \rightarrow aB \mid a$
 $B \rightarrow bA \mid b$
 $C \rightarrow a$.

Module-4

- 7 a. State and prove pumping lemma for context free languages. Show that
 $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free. (10 Marks)
- b. Explain Turing machine model. (06 Marks)

OR

- 8 a. Design a Turing machine to accept the language $L = \{0^n 1^n 2^n \mid n \geq 1\}$. (08 Marks)
- b. Design a Turing machine to accept strings of a's and b's ending with ab or ba. (08 Marks)

Module-5

- 9 a. Explain the following :
 i) Non deterministic Turing machine ii) Multi-tape Turing machine. (06 Marks)
- b. Define the following :
 i) Recursively enumerable language ii) Decidable language. (06 Marks)
- c. What is Post correspondence problem? (04 Marks)

OR

- 10 a. What is Halting problem of Turing machine? (06 Marks)
- b. Define the following : i) Quantum computer ii) Class NP. (06 Marks)
- c. Explain Church Turing Thesis. (04 Marks)

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15CS552

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Introduction to Software Testing

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain about software quality with respect to quality attributes and reliability. (08 Marks)
b. Explain the classification of test metrics used in software testing. (08 Marks)

OR

- 2 a. Explain about the Error and Fault Taxonomies in a perspective testing with respect to types and instances. (08 Marks)
b. Explain the levels of abstraction and testing in the waterfall model in a levels of testing. (08 Marks)

Module-2

- 3 a. Discuss the triangle problem with respect to problem statement, traditional implementation and structured implementation. (08 Marks)
b. Explain the difference between Robustness Testing and Worst Case Testing. (08 Marks)

OR

- 4 a. Explain the following equivalence class testing with respect to:
i) Weak Normal ii) Strong Normal
iii) Weak Robust iv) Strong Robust (08 Marks)
b. Explain the Decision Table – Based Testing with any one suitable examples. (08 Marks)

Module-3

- 5 a. Explain the Fault-Based Testing Terminologies with respect to assumptions. (08 Marks)
b. Difference between statement testing and condition testing with respect to structural testing. (08 Marks)

OR

- 6 a. Explain the following with respect to path testing:
i) DD – Paths
ii) McCabe's Basis Path Method. (08 Marks)
b. Explain about slice based testing with suitable examples with respect to data flow testing. (08 Marks)

Module-4

- 7 a. Explain the following with respect to Test Execution:
i) Scaffolding
ii) Test Oracles (08 Marks)
b. Explain the six basic principles that characterize various approaches and techniques for analysis and testing. (08 Marks)

OR

- 8 a. Explain the difference between Risk Planning and the Quality Team with respect to planning and monitoring the process. (08 Marks)
- b. Explain about the quality and Process with respect to planning and monitoring the process. (08 Marks)

Module-5

- 9 a. Explain some of the possible manifestations of incomplete specifications and faulty implementation with reference to Integration and Component based Software Testing. (08 Marks)
- b. Explain the following in brief notes on:
- i) System Testing
 - ii) Acceptance Testing
 - iii) Regression Testing
- (08 Marks)

OR

- 10 a. Draw the context diagram of the simple Automatic Teller Machine (SATM) system with SATM Terminal and 15 Screens for the SATM system. (08 Marks)
- b. Explain the following Decomposition Based Integration Testing with respect to:
- i) Top-Down Integration
 - ii) Bottom-up Integration
 - iii) Sandwich Integration
- (08 Marks)

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15CS553

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Advanced JAVA and J2EE

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is auto-boxing? Write a program to demonstrate autoboxing/unboxing. (05 Marks)
- b. What do you mean by type wrapper? Explain numeric type wrapper with an example program in JAVA. (05 Marks)
- c. Explain the following methods of java.lang.Enum with an example:
i) ordinal() ii) compareTo() iii) equals() (06 Marks)

OR

- 2 a. Demonstrate single annotation with an example. (04 Marks)
- b. Explain following built-in annotations with a program in Java:
i) @Override ii) @Inherited iii) @Retention (06 Marks)
- c. Explain different retention policies for annotations in Java. (06 Marks)

Module-2

- 3 a. Explain ArrayList. Write a program to demonstrate how ArrayList can be used to insert and remover string. (08 Marks)
- b. Explain Queue interface. Explain different methods defined by Queue. (08 Marks)

OR

- 4 a. Create a class STUDENT with two private-string members: USN, Name using LinkedList class in Java, write a program to add atleast 3 objects of above STUDENT class. Also display the data in neat format. (08 Marks)
- b. Explain ArrayList class and explain following methods:
i) binarySearch ii) copyOf iii) equals iv) fill (08 Marks)

Module-3

- 5 a. Explain following StringBuffer methods with an example:
i) insert ii) append iii) replace iv) substring (08 Marks)
- b. Differentiate String and StringBuffer class. Write a program to demonstrate different construction of String class. (08 Marks)

OR

- 6 a. Write a program to remove duplicate characters from a given string and display the resultant string. (06 Marks)
- b. Differentiate between equals() and == with respect to string with a program. (06 Marks)
- c. Explain following character extraction method: i) charAt() ii) toCharArray() (04 Marks)

Module-4

- 7 a. What is the role of Tomcat server? Explain different steps involved in configuring for development of servlet program execution. (08 Marks)
- b. Write a Java servlet program to accept two parameter from webpage, find the sum of them. display the result in web page. Also give necessary html script to create web page. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain different JSP tags with a program to demonstrate all tags. (08 Marks)
b. What are cookies? How cookies are handled in JSP? Write a program to create with name "Username" and cookie value "xyz". Also display stored cookie in webpage. (08 Marks)

Module-5

- 9 a. What are database drivers? Explain different JDBC driver types. (08 Marks)
b. List and explain various statement objects in JDBC. (08 Marks)

OR

- 10 a. Explain different steps involved in JDBC process, with a code snippet. Also give exception handling block. (08 Marks)
b. Write a program to connect to database with following information:
Drive: JDBC/ODBC bridge
URL: "jdbc:odbc:Ex"
Username: "xyz"
Password: "123"
Retrieve all rows with marks > 60 using prepared statement object. Assume following table:
Table Name : STUDENT
Fields : USN-Varchar (20)
Marks-int
Name-Varchar (25)

(08 Marks)

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15CS564

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Dot Net Frame Work for Application Development

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain Namespaces and Assemblies in brief. (04 Marks)
- b. Explain concept of named arguments with programming example. (06 Marks)
- c. Write a C # program to find factorial of a given number. (06 Marks)

OR

- 2 a. Explain how to use while, for, and do statements to execute code repeatedly while some Boolean condition is true with an example. (08 Marks)
- b. Define Exception. Explain how to catch and handle exceptions by using the try and catch constructs with programming example. (08 Marks)

Module-2

- 3 a. Explain Anonymous classes, with an example. (04 Marks)
- b. Explain Boxing and Unboxing, with an example. (06 Marks)
- c. Explain how arguments are passed as method parameters by using 'ref' and 'out' keywords. (06 Marks)

OR

- 4 a. Define Constructor. Explain constructor overloading with a programming example. (08 Marks)
- b. Write a C # program to compute row sum and column sum of rectangular array. (08 Marks)

Module-3

- 5 a. Explain the concept of params array with programming example. (06 Marks)
- b. Define Inheritance. Explain how to create a derived class that inherits features from a base class, with an example program. (06 Marks)
- c. Explain Abstract class and Abstract method, with an example. (04 Marks)

OR

- 6 a. Explain how to manage system resources by using Garbage collector. (06 Marks)
- b. Explain how to implement interface in a class with programming example. (06 Marks)
- c. Explain Sealed classes and Sealed methods in brief. (04 Marks)

Module-4

- 7 a. Explain read – only and write – only properties with an example. (04 Marks)
- b. Compare indexers and arrays with an example. (04 Marks)
- c. Explain Binary tree Algorithm, with an example. (08 Marks)

OR

- 8 a. What is an Indexer? List and explain set of operators provided by C # that you can use to access and manipulate the individual bits in an int. (08 Marks)
- b. Explain Linked list < T > collection class with programming example. (08 Marks)

Module-5

- 9 a. Explain how to implement an enumerator manually with an example. (06 Marks)
- b. Define Delegate. Explain how to declare delegate with an example. (05 Marks)
- c. Explain how to handle and event by using a delegate, with an example. (05 Marks)

OR

- 10 a. What is LINQ? Explain LINQ to selecting and ordering data, with an example. (08 Marks)
- b. Explain Operator overloading and their constraints with a programming example. (08 Marks)

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15CS52

Fifth Semester B.E. Degree Examination, June/July 2019 Computer Networks

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe in detail the services offered by DNS and explain the DNS message format. (08 Marks)
- b. Illustrate the basic operation of SMTP and FTP. (08 Marks)

OR

- 2 a. Explain the persistent and non-persistent connection of HTTP. (08 Marks)
- b. Define a socket. Describe the socket programming using TCP. (08 Marks)

Module-2

- 3 a. Draw and explain the FSM for sender and receiver side of rdt 2.1 protocol. (08 Marks)
- b. Elaborate the three-way handshaking procedure used in TCP. (04 Marks)
- c. Suppose that 2 measured sample RTT values are 106 ms and 120 ms. Compute
 - (i) Estimated RTT after each of these sample RTT value is obtained, Assume $\alpha = 0.125$ and estimated RTT is 100 ms just before first of the sample obtained.
 - (ii) Compute DevRTT, Assume $\beta = 0.25$ and DevRTT was 5 msec before first of these samples are obtained. (04 Marks)

OR

- 4 a. With an FSM, explain the three phases of congestion control. (08 Marks)
- b. Write the TCP segment structure and explain its fields. (04 Marks)
- c. Elaborate the working of Go-Back N protocol. (04 Marks)

Module-3

- 5 a. Give the format of IPV6 datagram and explain the fields. (06 Marks)
- b. What are the message types used in IGMP? (03 Marks)
- c. Write the link state routing algorithm and apply it to the following graph with source node [Refer Fig.Q5(c)] is 'u'. (07 Marks)

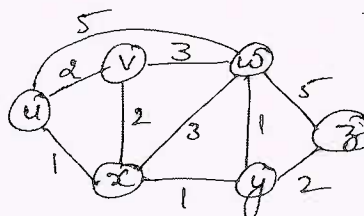


Fig.Q5(c)

OR

- 6 a. What is routing? Write the structure of a router. (07 Marks)
- b. List the broadcast routing algorithms? Explain any one of them. (04 Marks)
- c. Describe the intra-AS routing protocols in detail (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Illustrate the two different approaches for routing to a mobile node. (08 Marks)
b. With a neat diagram, bring out the steps for mobile node registration to home agent. (08 Marks)

OR

- 8 a. Bring out the components of 3G Cellular Network architecture. (08 Marks)
b. State handoff? What are the steps involved in accomplishing handoff. (05 Marks)
c. Explain the three phases of mobile IP. (03 Marks)

Module-5

- 9 a. Bring out the leaky bucket mechanism for traffic policing. (07 Marks)
b. Classify the multimedia network applications. (03 Marks)
c. Describe the link scheduling mechanisms. (06 Marks)

OR

- 10 a. List the categories of streaming stored video. Explain any one of them. (08 Marks)
b. Explain the working of CDN. (08 Marks)

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15CS53

Fifth Semester B.E. Degree Examination, June/July 2019 Database Management System

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define DBMS. Discuss the advantages of DBMS over the traditional file system. (08 Marks)
 b. Explain the component modulus of DBMS and their interaction, with the help of a diagram. (08 Marks)

OR

- 2 a. Define the following with an example :
 i) Weak entity type ii) Participation constraints
 ii) Cardinality ratio iv) Recursive relationship. (08 Marks)
 b. Draw an ER diagram of Banking system taking into account atleast five entities, indicate all keys, constraints and assumptions that are made. (08 Marks)

Module-2

- 3 a. What is meant by Integrity Constraint? Explain the importance of referential integrity constraint. How referential integrity constraint is implemented in SQL? (08 Marks)
 b. Consider the following Movie database ;
 Movie (Title , director , Myear , Rating)
 Actors (Actor , Aage)
 Acts (Actor , title)
 Directors (Director , dage)
 Write the following queries in relational algebra on the database given ;
 i) Find movies made by "Hanson" after 1997.
 ii) Find all actors and directors.
 iii) Find "Coen's" movie with "Mc Dormand".
 iv) Find (director , actor) pairs where the director is younger than the actor. (08 Marks)

OR

- 4 a. Discuss insulation , deletion and modification anomalies. Why are they considered bad? Illustrate with an example. (08 Marks)
 b. Write the SQL queries for the following relational schema ;
 Sailors (Sid , Sname , Rating, Age)
 Boats (Bid , Bname , color)
 Reserve (Sid , Bid , Day)
 i) Retrieve the Sailor's name who have reserved red and green boat.
 ii) Retrieve the no : of boats which are not reserved.
 iii) Retrieve the Sailors name who have reserved boat number 103.
 iv) Retrieve the Sailors name who have reserved all boats. (08 Marks)

Module-3

- 5 a. How are triggers and assertions defined in SQL? Explain. (08 Marks)
 b. How are views created and dropped? Explain how the views are implemented and updated. (08 Marks)

OR

- 6 a. Explain the Single-tier and Client-server architecture, with a neat diagram. (08 Marks)
 b. Explain the following :
 i) Embedded SQL ii) Database stored procedure. (08 Marks)

Module-4

- 7 a. Which Normal form is based on the concept of transitive functional dependency? Explain the same with an example. (08 Marks)
 b. What is the need for normalization? Consider the relation :
 Emp-proj = {SSn, Pnumber, Hours, Ename, Pname, Plocation}.
 Assume {SSn, Pnumber} as primary key.
 The dependencies are ;
 {SSn, Pnumber} → Hours
 SSn → Ename
 Pnumber → {Pname, Plocation}
 Normalize the above relation to 3NF. (08 Marks)

OR

- 8 a. What is Functional Dependency? Find the minimal cover using the minimal cover algorithm for the following functional dependency.
 $F = \{AB \rightarrow D, B \rightarrow C, AE \rightarrow B, A \rightarrow D, D \rightarrow EF\}$. (08 Marks)
 b. Consider two sets of functional dependency.
 $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$ and $G = \{A \rightarrow CD, E \rightarrow AH\}$.
 Are they equivalent? (08 Marks)

Module-5

- 9 a. Discuss the ACID properties of a database transaction. (04 Marks)
 b. Why Concurrency control is needed? Demonstrate with an example. (12 Marks)

OR

- 10 a. Discuss the UNDO and REDO operations and the recovery techniques that use each. (06 Marks)
 b. Discuss the time-stamp ordering protocol for concurrency control. (05 Marks)
 c. Explain how shadow paging helps to recover from transaction failure. (05 Marks)

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15CS/IS54

Fifth Semester B.E. Degree Examination, June/July 2019 Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define the following : i) string ii) alphabet iii) language. (06 Marks)
- b. Design a deterministic finite state machine for the following language over $\Sigma = \{a, b\}$.
 - i) $L = \{W \mid |W| \bmod 3 > |W| \bmod 2\}$
 - ii) $L = \{w \mid W \text{ ends either with } ab \text{ or } ba\}$. (10 Marks)

OR

- 2 a. Write a note on finite state transducers. (07 Marks)
- b. Define DFSM? Minimize the following FSM. [Refer Fig.Q2(b)]

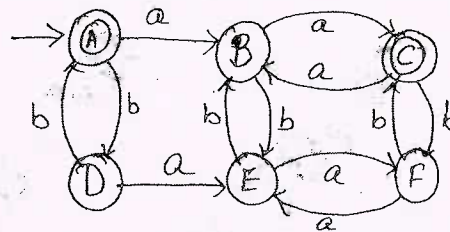


Fig.Q2(b)

(09 Marks)

Module-2

- 3 a. Write the equivalent Regular Expression for the given Finite state machine. [Refer Fig.Q3(a)] (08 Marks)

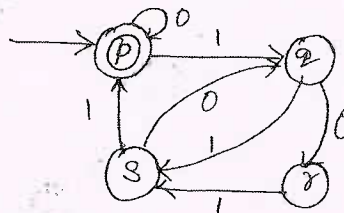


Fig Q3(a)

- b. Write the Regular Expression for the following language.
 - i) $\{w \in \{a, b\}^* \text{ with atmost one } a\}$
 - ii) $\{w \in \{a, b\}^* \text{ does not end with } ba\}$
 - iii) $\{w \in \{0, 1\}^* \text{ has substring } 001\}$
 - iv) $\{w \in \{0, 1\}^* \mid |W| \text{ is even}\}$. (08 Marks)

OR

- 4 a. State and prove the pumping theorem for regular language. (08 Marks)
- b. Show that the language $L = \{a^n b^n \mid n \geq 0\}$ is not regular. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Define grammar. Write the CFG for the following language.
- i) $L = \{w \in \{a, b\}^* \mid n_a(w) = n_b(w)\}$
- ii) $L = \{a^i b^j \mid i = j+1\}$. (08 Marks)
- b. What is inherent ambiguity? Show that the language given is inherently ambiguous?
- $L = \{a^n b^n c^m \mid n, m \geq 0\} \cup \{a^n b^m c^n \mid n, m \geq 0\}$. (08 Marks)

OR

- 6 a. Define PDA? Design PDA for the language $L = \{a^n b^m a^n \mid n, m \geq 0\}$. (06 Marks)
- b. Convert the following language from CFG to PDA $L = \{ww^R \mid w \in \{0, 1\}^*\}$. (06 Marks)
- c. Convert the following CFG to CNF $E \rightarrow E + E \mid E * E \mid (E) \mid id$. (04 Marks)

Module-4

- 7 a. Prove that the language $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free. (08 Marks)
- b. Prove that CFL are not closed under intersection, complement or difference? (08 Marks)

OR

- 8 a. Design a Turing machine to accept $L = \{a^n b^n c^n \mid n \geq 0\}$. (08 Marks)
- b. Define a turning machine. Explain the working of a turning machine. (05 Marks)
- c. Write a note on multitape machine. (03 Marks)

Module-5

- 9 Write a short notes on :
- a. Growth rate of function (05 Marks)
- b. Church-turning thesis (06 Marks)
- c. Linear bounded automata. (05 Marks)

OR

- 10 Write a short notes on :
- a. Post correspondence problem (05 Marks)
- b. Halting problem in turning machine (05 Marks)
- c. Various types of turning machine. (06 Marks)

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15CS546

Fifth Semester B.E. Degree Examination, June/July 2019 Dot Net Framework for Application Development

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing
ONE full question from each module.*

Module-1

- 1 a. What is a console application? Explain the steps to create a console application in visual studio 2015. (07 Marks)
- b. Explain the purpose of namespaces and assemblies. (04 Marks)
- c. Explain the steps to create a graphical application and create a user interface to print the greeting message. (05 Marks)

OR

- 2 a. Define local scope and class scope. (02 Marks)
- b. Create a method that calculates all arithmetic operations (+, -, *, /, %(mod)) and explain the procedure to generate a method stub wizard that help you to write methods. Explain the use of visual studio 2015 debugger to step in and step out of method call as they run. (10 Marks)
- c. Explain the exception handling using try and catch statements. (04 Marks)

Module-2

- 3 a. Explain the propose of encapsulation and define a class and control the accessibility of members in a class, illustrate with an example? (07 Marks)
- b. What is a constructor? Explain the object creation that invoke the constructor, write and call your own constructor by explaining with an example. (05 Marks)
- c. Explain in detail anonymous classes with an example. (04 Marks)

OR

- 4 a. Explain ref and out parameters with an example. (06 Marks)
- b. Give the differences between a structure and class. (04 Marks)
- c. Write a method that can accept any number of arguments of any type by using the params keyword. (06 Marks)

Module-3

- 5 a. What is inheritance? Discuss about method hiding and overriding by using the new, virtual and override keywords. (08 Marks)
- b. Define an interface by specifying the signatures and return type of methods and implement an interface in a structure and class. (08 Marks)

OR

- 6 a. Explain in detail how garbage collection works. (08 Marks)
- b. Given the purpose dispose method and explain the calling of dispose method from destructor. (08 Marks)

Module-4

- 7 a. Explain the use of get and set assessors. (06 Marks)
b. Describe an interface containing properties by using structure and classes. (04 Marks)
c. What is an indexer? Differentiate between indexers and arrays. (06 Marks)

OR

- 8 a. Explain in detail about generics. (02 Marks)
b. Explain the functionality provided in the different collection classes available within the •NET frame work. (14 Marks)

Module-5

- 9 a. Define an enumerator that can be used to iterate over the elements in a collection. (04 Marks)
b. Explain the use of delegates and given examples of delegates in the •NET framework class library. (12 Marks)

OR

- 10 a. Declare an event. Explain in detail about raising an event and handling an event by using a delegate. (06 Marks)
b. Define Language-Interred Query (LINQ) queries to examine the contents of enumerable collections. (10 Marks)

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15CS61

Sixth Semester B.E. Degree Examination, June/July 2019 Cryptography, Network Security and Cyber Law

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe the types of Vulnerabilities to domain of security. (04 Marks)
- b. List the guiding principles of security. (04 Marks)
- c. Write the extended Euclidean algorithm, with an example. (08 Marks)

OR

- 2 a. Calculate the value of x using Chinese remainder theorem by given below data :
 $N = 210$, $n_1 = 5$, $n_2 = 6$, $n_3 = 7$, $x_1 = 3$, $x_2 = 5$, $x_3 = 2$. (05 Marks)
- b. Explain the Vigenere Cipher and the Hill Cipher techniques with illustration. (06 Marks)
- c. With neat diagram, explain Fiestel structure. (05 Marks)

Module-2

- 3 a. Illustrate the RSA algorithm for encryption and decryption. (08 Marks)
- b. Briefly explain the practical issues of RSA algorithm. (04 Marks)
- c. List the properties of the cryptographic hash. (04 Marks)

OR

- 4 a. Discuss the case study : SHA – I. (08 Marks)
- b. Explain the Man – In – the Middle attack on Diffie – Hellman key exchange. with neat diagram. (08 Marks)

Module-3

- 5 a. Explain the different Public Key Infrastructure (PKI) architectures. (08 Marks)
- b. Describe the Mutual authentication using a shared secret. (08 Marks)

OR

- 6 a. Explain the Kerberos message sequence with diagram. (06 Marks)
- b. Describe the IP Sec protocols Authentication Header and Encapsulating Security Pay load in transport mode. (05 Marks)
- c. Explain Secure Sockets Layer (SSL) hand shake protocol. (05 Marks)

Module-4

- 7 a. Explain the Authentication and Master Session Key exchange in 802.11i. (05 Marks)
- b. List and explain the worm characteristics. (05 Marks)
- c. Explain Firewall functionality and Proxy fire wall. (06 Marks)

OR

- 8 a. Write a note on Intrusion Detection System (IDS). (05 Marks)
- b. Explain the types of Intrusion Detection System. (05 Marks)
- c. Briefly explain the Technologies for Web Services. (06 Marks)

Module-5

- 9 a. Explain Digital Signature Certificates. (10 Marks)
- b. Describe the duties of Subscribers. (06 Marks)

OR

- 10 a. List any eight functions of the Controller. (08 Marks)
- b. Briefly explain Penalties and Adjudication in IT Act. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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15CS62

Sixth Semester B.E. Degree Examination, June/July 2019 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Compare random scan display with raster scan display and list the applications of computer graphics. (04 Marks)
- b. What is OpenGL? With the help of block diagram explain Library organization of OpenGL program and give the general structure of OpenGL program. (04 Marks)
- c. What is DDA? With the help of a suitable example demonstrate the working principle of Bresenham's Line drawing algorithm for different slopes of a line. (08 Marks)

OR

- 2 a. Define the following terms with respect to computer graphics.
i) Bitmap ii) Pixmap iii) aspect ratio iv) Frame buffer (04 Marks)
- b. List and explain various OpenGL primitive and its attribute functions. Develop an OpenGL program to create human face like structure using suitable OpenGL primitive functions. (06 Marks)
- c. With the help of a suitable example demonstrate Bresenham's circle drawing algorithm. (06 Marks)

Module-2

- 3 a. Explain scan line polygon fill algorithm. Determine the content of the active edge table to fill the polygon with vertices A(2, 4), B(4, 6) and C(4, 1) for $y = 1$ to $y = 6$. (06 Marks)
- b. Develop composite homogeneous transformation matrix to rotate an object with respect to a Pivot point. For the triangle A(3, 2) B(6,2), C(6, 6) rotate it in anticlockwise direction by 90 degree keeping A(3, 2) fixed, draw the new polygon. (06 Marks)
- c. With the help of a diagram explain shearing and reflection transformation technique. (04 Marks)

OR

- 4 a. Explain the data structures used by scan line polygon fill algorithm. Determine the content of active edge table to fill the polygon with vertices A(2, 4), B(2, 7), C(4, 9) and D(4, 6). (06 Marks)
- b. Give the reason to convert transformation matrix to homogeneous co-ordinate representation and show the process of conversion. Shear the polygon A(1, 1), B(3, 1), C(3, 3) D(2, 4), E(1, 3) along x-axis with a shearing factor of 0.2. (06 Marks)
- c. i) Prove that two successive 2D rotation are additive (04 Marks)
ii) Prove that successive scaling are multiplicative.

Module-3

- 5 a. Design a transformation matrix for window to viewport transformation. And explain how reshape function (glutReshapeFunc) works in OpenGL programming. (05 Marks)
- b. With the help of a suitable diagram explain basic 3D Geometric transformation techniques and give the transformation matrix. Explain the meaning of affine transformation. (05 Marks)
- c. With the help of OpenGL statements and diagram explain illumination and shading models. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. What is Clipping? With the help of a suitable example explain Cohen-Sutherland line clipping algorithm. (06 Marks)
- b. Design transformation matrix to rotate a 3D object about an axis that is parallel to one of the co-ordinate axes. (06 Marks)
- c. With the help of a suitable diagram, explain basic illumination, RGB and CMY colour models. (04 Marks)

Module-4

- 7 a. What is 3D viewing? With the help of a block diagram, explain 3D viewing pipeline architecture. (04 Marks)
- b. Design the transformation matrix for orthogonal and perspective projections. (06 Marks)
- c. Explain Depth buffer method and give the OpenGL visibility detection functions. (06 Marks)

OR

- 8 a. Explain the steps for transformation from world to viewing coordinate system. (04 Marks)
- b. Design the transformation matrix for perspective projection and give OpenGL 3D viewing functions. (06 Marks)
- c. Give the general classification of visible detection algorithm and explain any one algorithm in detail. (06 Marks)

Module-5

- 9 a. With the help of a suitable programming construct explain event driven input menu picking and Building interactive models. (08 Marks)
- b. Write a short notes on (any two)
- i) Curve and Quadric surfaces
 - ii) OpenGL curve and surface functions
 - iii) Bezier curve and surfaces. (08 Marks)

OR

- 10 a. What are display lists? Explain the steps to develop interactive models and animating interactive programs. (08 Marks)
- b. Write a short note on (any two)
- i) Logic operations (graphics)
 - ii) Input devices or clients and servers
 - iii) Bezier spline curve and OpenGL curve functions. (08 Marks)

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15CS63

Sixth Semester B.E. Degree Examination, June/July 2019 System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain SIC/XE architecture. (08 Marks)
 b. Generate the complete object program for the following SIC/XE assembly program.

```

WRREC  START  405D
        CLEAR  X
        LDT   LENGTH
WLOOP  TD     OUTPUT
        JEQ   WLOOP
        LDCH  BUFFER, X
        WD   OUTPUT
        TIXR T
        JLT  WLOOP
        RSUB
OUTPUT BYTE  X '05'
        END

Address of BUFFER      4033
Address of LENGTH     4036
    
```

Op Codes :

CLEAR – B4 ; JEQ – 30; WD – DC; JLT – 38;
 LDT – 74; LDCH – 50; TIXR – B8; RSUB – 4C. (08 Marks)

OR

- 2 a. List all assembler independent and dependant features and explain program relocation. (05 Marks)
 b. Explain the data structures used in macro processor with example. (03 Marks)
 c. Explain the following macroprocessor independent features.
 i) Generation of unique lables (08 Marks)
 ii) Keyword macro parameter.

Module-2

- 3 a. What is loader? What are the basic functions the loader has to perform? (04 marks)
 b. Develop an algorithm for bootstrap loader. (07 marks)
 c. Explain dynamic linking with suitable diagram. (05 Marks)

OR

- 4 a. Differentiate between a linking loader and linkage editor, with the help of suitable diagram. (08 marks)
 b. Explain different loader option commands with examples. (04 marks)
 c. Illustrate MS – DOS object module with its record types. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-3

- 5 a. With the help of a diagram, explain the various phases of compiler. (08 Marks)
 b. Explain the concept of input buffering in the lexical analysis. (04 Marks)
 c. What design objectives, compiler optimizations must meet. (04 Marks)

OR

- 6 a. Write a LEX program for the tokens given below : (08 Marks)

LEXEMES	TOKEN NAME	ATTRIBUTE VALUE
Any WS	---	---
if	if	---
then	then	---
else	else	---
Any id	id	ptr to table entry
Any number	number	ptr to table entry
<	reloop	LT
<=	reloop	LE
=	reloop	EQ
< >	reloop	NE
>	reloop	GT
>=	reloop	GE

- b. Write regular definitions for unsigned numbers and draw the transition diagram for the same. (08 Marks)

Module-4

- 7 a. Define left recursion grammer, eliminate left recursion from the following grammer :
 $S \rightarrow aB \mid ac \mid sd \mid se$
 $B \rightarrow bBc \mid f$
 $C \rightarrow g$. (03 Marks)
- b. Consider the following context free grammer $S \rightarrow SS + \mid SS * \mid a$ and the input string $aa + a^*$
 i) Give LMD and RMD
 ii) Parse tree
 iii) Is the grammer ambiguous? Why
 iv) Describe the language generated by the grammer
 v) Left factor the grammer. (05 Marks)
- c. Consider the following grammer with terminals (, [,) ,]
 $S \rightarrow TS \mid [S] S \mid)S \mid \epsilon$
 $T \rightarrow (x)$
 $X \rightarrow TX \mid [X] X \mid \epsilon$
 i) Construct first and follow sets
 ii) Construct its LL(1) parsing table
 iii) Is this grammer LL(1)? (08 marks)

OR

- 8 a. The following is ambiguous grammar

$$S \rightarrow AS \mid b$$

$$A \rightarrow SA \mid a$$

Construct for this grammar its collection of sets of LR(0) items. If we try to build an LR -- parsing table for the grammar, there are certain conflicting actions what are they? Suppose we tried to use the parsing table by non deterministically choosing a possible action whenever there is a conflict, show all the possible sequences of actions on input abab\$.

(10 Marks)

- b. What are the actions of a shift -- reduce parser. Design shift -- reduce parser for the following grammar on the input 10201 $S \rightarrow 0 S 0 \mid 1 S 1 \mid 2$.

(06 Marks)

Module-5

- 9 a. Consider the context free grammar given below :

$$S \rightarrow EN$$

$$E \rightarrow E + T \mid E - T \mid T$$

$$T \rightarrow T * F \mid T / F \mid F$$

$$F \rightarrow (E) \mid \text{digit}$$

$$N \rightarrow ;$$

- i) Obtain the SDD for the above grammar
 ii) Construct annotated parse tree for the input string $5 * 6 + 7$. (08 Marks)
- b. Obtain the DAG for the expression, show the steps $a + a * (b - c) + (b - c) * d$. (04 Marks)
- c. Translate the assignment $a = b * - c + b * - c$ into
 i) Three address code
 ii) Quadruples. (04 Marks)

OR

- 10 a. Explain the issues in the design of a code generator. (11 marks)
- b. Write the machine instructions for the following three address instructions :
- $b = a[i]$
 - $a[j] = c$
 - $x = *p$
 - $*p = y$
 - if $x < y$ got L. (05 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2019 Operating Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the role of operating system from different viewpoints. Explain the dual mode of operation of an operating system. (07 Marks)
- b. Demonstrate the concept of virtual machine with an example. (05 Marks)
- c. Explain the types of multiprocessing system and the types of clustering. (04 Marks)

OR

- 2 a. Describe the implementation of interprocess communication using shared memory and message passing. (06 Marks)
- b. Demonstrate the operations of process creation and process termination in UNIX. (06 Marks)
- c. Explain the different states of a process, with a neat diagram. (04 Marks)

Module-2

- 3 a. Discuss the threading issues that come with multithreaded program. (08 Marks)
- b. Illustrate how Reader's-Writer's problem can be solved by using semaphores. (08 Marks)

OR

- 4 a. Calculate the average waiting time by drawing Gantt chart using FCFS (First Come First Serve), SRTF (Shortest Remaining Time First), RR (Round Robin) [$q = 2$ ms] algorithms.

Process	Arrival time	Burst time
P ₁	0	9
P ₂	1	4
P ₃	2	9
P ₄	3	5

- b. Explain the Dining-Philosopher's problem using monitors. (08 Marks)

Module-3

- 5 a. Determine whether the following system is in safe state by using Banker's algorithm.

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	0	4	3	3			

- b. If a request for P₁ arrives for (1 0 2), can the request be granted immediately? (09 Marks)
- c. Discuss the various approaches used for deadlock recovery. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Illustrate with example, the internal and external fragmentation problem encountered in continuous memory allocation. (07 Marks)
b. Explain the structure of page table. (09 Marks)

Module-4

- 7 a. Illustrate how demand paging affects systems performance. (08 Marks)
b. Describe the steps in handling a page fault. (08 Marks)

OR

- 8 a. Explain the various types of directory structures. (08 Marks)
b. Describe various file allocation methods. (08 Marks)

Module-5

- 9 a. Explain the access matrix model of implementing protection in operating system. (07 Marks)
b. Explain the following disk scheduling algorithm in brief with examples:
i) FCFS scheduling
ii) SSTF scheduling
iii) SCAN scheduling
iv) LOOK scheduling (09 Marks)

OR

- 10 a. Explain the components of LINUX system with a neat diagram. (08 Marks)
b. Explain the way process is managed in LINUX platform. (08 Marks)

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15CS651

Sixth Semester B.E. Degree Examination, June/July 2019 Data Mining and Data Warehousing

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe a 3 – tier data warehousing architecture. (06 Marks)
- b. Compare OLTP and OLAP Systems. (06 Marks)
- c. What is a Data warehouse and what are its four key features? (04 Marks)

OR

- 2 a. Explain with suitable examples the various OLAP operations in a multidimensional data model. (07 Marks)
- b. Explain the following terms with examples : i) Snowflake schema ii) Fact constellation schema iii) Star schema (09 Marks)

Module-2

- 3 a. Describe ROLAP . MOLAP , HOLAP. (06 Marks)
- b. What is Data Mining? With a neat diagram, explain the KDD process in data mining. (06 Marks)
- c. For the following vectors X and Y, calculate the cosine similarity, where $X = \{3 \ 2 \ 0 \ 5 \ 0 \ 0 \ 0 \ 2 \ 0 \ 0\}$, $Y = \{1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 2\}$. (04 Marks)

OR

- 4 a. Describe the various types of attributes and data sets. (08 Marks)
- b. Define Data preprocessing. Mention the steps involved in it. Explain any 2 steps in detail. (08 Marks)

Module-3

- 5 a. Briefly explain the Apriori Algorithm for frequent itemset generation. (05 Marks)
- b. Explain the following terms with example : (06 Marks)
- i) Rule – generation ii) Computational complexity.
- c. Generate frequent itemset for the given data with support = 50%. (05 Marks)

TID	100	200	300	40
Items	{1, 3, 4}	{2, 3, 5}	{1, 2, 3, 5}	{2, 5}

OR

- 6 a. Consider the following transaction data set : (09 Marks)
- i) Construct an FP tree ii) Generate the list of frequent itemset.
- Ordered by their corresponding suffixes.

TID	1	2	3	4	5	6	7
Items	{a, b}	{b, c, d}	{a, c, d, e}	{a, d, e}	{a, b, c}	{a, b, c, d}	{a}

8	9	10
{a, b, c}	{a, b, d}	{b, c, e}

- b. Briefly explain the candidate generation procedure using $F_{k-1} \times F_{k-1}$ Merging strategy. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-4

- 7 a. Explain how decision tree induction algorithm works. Give example. (08 Marks)
b. List and explain the different characteristics of decision tree induction. (08 Marks)

OR

- 8 a. Describe the nearest neighbour classification technique. (09 Marks)
b. Write a note on Bayesian classifier. (07 Marks)

Module-5

- 9 a. What is Cluster analysis? Describe the different types of clustering techniques with example. (08 Marks)
b. Explain the following terms :
i) K – means clustering ii) Graph based clustering. (08 Marks)

OR

- 10 a. What are the basic approaches used for generating a agglomerative hierarchical clustering? (08 Marks)
b. Explain D B Scan algorithm, with example. (08 Marks)

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15CS664

Sixth Semester B.E. Degree Examination, June/July 2019

Python Application Programming

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List the features of Python Programming Language (at least FIVE). (05 Marks)
- b. What is the role of a programmer? List two skills required to be a programmer. (05 Marks)
- c. Explain the chained and nested conditional execution statements along with syntax and flow chart. (06 Marks)

OR

- 2 a. What are Python words and sentences? Explain with an example for each. (04 Marks)
- b. Differentiate compiler and interpreter. (04 Marks)
- c. Write python programs to i) Find largest of three numbers (08 Marks)
ii) Check whether the given year is leap year or not with functions.

Module-2

- 3 a. With syntax, explain the finite and infinite looping constructs in python. What is the need for break and continue statements. (08 Marks)
- b. Write a Python program to generate and print prime numbers between 2 to 50. (04 Marks)
- c. What are String slices? Explain the slicing operator in Python with examples. (04 Marks)

OR

- 4 a. Write a Python program to count the number of occurrences of a given word in a file. (06 Marks)
- b. Write a Python function that takes decimal number as input and convert that to binary equivalent and return the same. (04 Marks)
- c. List any six methods associated with strings and explain each of them with an example. (06 Marks)

Module-3

- 5 a. What are the ways of traversing a list? Explain with an example for each. (04 Marks)
- b. Differentiate Pop and Remove methods on lists. How to delete more than one element from a list. (06 Marks)
- c. Write a Python program that accepts a sentences and build dictionary with LETTERS, DIGITS , UPPER CASE , LOWER CASE as key values and their count in the sentences as values. Ex : Sentence = "VTU@123.e-Learning"
d = {"LETTERS" : 12, "DIGITS" : 3, "UPPER CASE" : 4 , "LOWER CASE" : 8}. (06 Marks)

OR

- 6 a. Compare and contrast lists and tuples. (04 Marks)
- b. Write a program to check the validity of a password read by users. The following criteria should be used to check the validity. Password should have atleast
i) One lower case letter ii) One digit iii) One upper case letter
iv) One special character from [\$ # @ !] v) Six character.
Your program should accept a Password and check the validity using above criteria and print "valid" or "invalid" as the case may be. (08 Marks)

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- c. Demonstrate i) how a dictionary items can be represented as a list of tuples.
ii) How tuples can be used as keys in dictionaries? (04 Marks)

Module-4

- 7 a. What is a Class? How to define a class in Python? How to instantiate a class and how the class members are accessed? (04 Marks)
b. Differentiate class variables and instance variables. (02 Marks)
c. Write a Python program that uses datetime module within a class, takes a birthday as input and prints the age and the number of days , hours, minutes and seconds until the next birthday. (10 Marks)

OR

- 8 a. Write a program that has a class Point with attributes as X and Y co-ordinates. Create two objects of this class and find the midpoint of both the points. Add a method reflex_x to class point, which returns a new point. Which is the reflection of the point about the x – axis.
Ex : point (5, 10) ⇒ reflex_x returns point (5, -10). (06 Marks)
b. Differentiate between simple, multiple and multi –level inheritance. (06 Marks)
c. Write a program that has a class Person , Inherit a class Student from Person which also has a class MarksAttendance. Assume the attributes for Person class as : USN, Name, dob, gender. Attributes for Student class as : Class , branch , year , MA.
Attributes for MarksAttendance : Marks, Attendance.
Create a student S = Student (“1AB16CS005”, “XYZ”, “18-1-90”, “M”, 85 , 98) and display the details of the student. (04 Marks)

Module-5

- 9 a. Demonstrate with the help of Python construct i) how to retrieve an image over HTTP.
ii) how to retrieve web pages with urllib. (08 Marks)
b. Compare and contrast the JavaScript object Notation (JSON) and XML. (04 Marks)
c. What is Service –Oriented Architecture? List the advantages of the same. (04 Marks)

OR

- 10 a. Write a Python program that retrieve an user's Twitter friends , Parse the returned JSON and extract some of the information about the friends. (08 Marks)
b. Create a simple spidering program that will go through Twitter accounts and build a database of them. (08 Marks)

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15CS61

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Cryptography, Network Security and Cyber Law

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define cyber security? Explain the motives of cyber attack. (05 Marks)
- b. Use extended Euclidean algorithm to find inverse of 12 modulo 79? (05 Marks)
- c. Apply Chinese remainder theorem to find square roots of 3 modulo 143 and list all square roots of -3 modulo 143. (06 Marks)

OR

- 2 a. Explain DES construction in detail. (05 Marks)
- b. Explain confusion and Diffusion with example. (05 Marks)
- Explain three sounds SPN Network. (06 Marks)

Module-2

- 3 a. Explain RSA operation in detail. (06 Marks)
- b. Explain Public Key Cryptography Standards (PKCS) (10 Marks)
- c. Explain Deffie Helman key exchange.

OR

- 4 a. If the RSA public key is (31, 3599) what is the corresponding private key. (05 Marks)
- b. Explain Basic properties of hash function. (05 Marks)
- c. Explain Birthday attack. (06 Marks)

Module-3

- 5 a. Explain identity based encryption. (05 Marks)
- b. Explain Needham Schroeder protocol version – 1. (05 Marks)
- c. Explain Kerberos with message sequence. (06 Marks)

OR

- 6 a. Explain password based one way authentication. (05 Marks)
- b. Explain Needham – Schroeder protocol version – 2. (05 Marks)
- c. Explain SSL Handshake protocol. (06 Marks)

Module-4

- 7 a. Explain authentication and master session key exchange in 802.11i? (05 Marks)
- b. Explain worm features. (05 Marks)
- c. Explain Function of Firewall. (06 Marks)

OR

- 8 a. Explain 802.11i four way handshanke with neat diagram. (05 Marks)
- b. List and explain practice issues of Firewall. (05 Marks)
- c. Explain DDOS attack prevention and detection. (06 Marks)

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Module-5

- 9 a. Discuss OFFENES defined as per IC Act 2000 (any Four) (08 Marks)
b. Explain briefly certifying authority, suspensions, and revocations of digital signature. (08 Marks)

OR

- 10 a. What is information technology act? Discuss scope and objectives. (08 Marks)
b. Discuss the provisions of the IT act as regards to the following :
i) Legal Recognition of Electronic records
ii) Authentication of electronic records. (08 Marks)

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15CS62

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is Computer Graphics? Explain the applications of computer graphics. (05 Marks)
- b. Illustrate the sequence of coordinate transformations from modeling coordinates to device-coordinates. (05 Marks)
- c. Explain DDA line drawing algorithm with procedure. (06 Marks)

OR

- 2 a. Explain the basic operation of CRT with its primary components with neat diagram. (08 Marks)
- b. Digitize the line by using Bresenham's line drawing algorithm with end-points (20, 10) and (30, 18), having slope 0.8. (08 Marks)

Module-2

- 3 a. How do you classify the polygon? Explain OpenGL polygon fill primitives. (07 Marks)
- b. Explain translation, scaling, rotation in 2D homogeneous coordinate system with matrix representations. (09 Marks)

OR

- 4 a. Explain general scan-line polygon-fill algorithm in detail. (10 Marks)
- b. What are the entities required to perform a rotation? Show that two successive rotations are additive. (06 Marks)

Module-3

- 5 a. Define clipping. Briefly explain Co-hen Sutherland line clipping without code. Discuss four cases. (10 Marks)
- b. Describe phong lighting model. (06 Marks)

OR

- 6 a. Clip the polygon given in Fig.Q.6(a), using Sutherland Hodgman polygon clipping algorithm with neat sketches. (06 Marks)

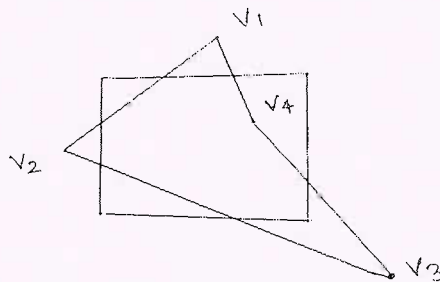


Fig.Q.6(a)

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- b. Explain the different types of light sources supported by OpenGL. (06 Marks)
- c. Explain the RGB and CMY color models. (04 Marks)

Module-4

- 7 a. Explain the perspective projections with reference point and vanishing point with neat diagrams. (10 Marks)
- b. Discuss depth-buffer method with algorithm. (06 Marks)

OR

- 8 a. Demonstrate how transformation from world coordinates to viewing coordinates with matrix representation. (06 Marks)
- b. Explain orthogonal projections in detail. (10 Marks)

Module-5

- 9 a. Explain the major characteristics that describe the logical behaviour of an input device. Explain how OpenGL provides the functionality of each of the classed of logical input devices. (08 Marks)
- b. Describe the logical input operation of picking in selection mode. (04 Marks)
- c. What is DisplayList? Write OpenGL code-segment that generate a blue colored square using display list. (04 Marks)

OR

- 10 a. Explain Bezier spline curves with equations and demonstrate the appearance of Bezier curves for various selection of control points. (08 Marks)
- b. What is double buffering? How it is implemented in OpenGL. (04 Marks)
- c. Differentiate event mode with request mode. (04 Marks)

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15CS64

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Operating Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Distinguish between the following terms :
 - i) Multiprogramming and multitasking
 - ii) Multiprocessor systems and clustered systems. (04 Marks)
- b. Analyze modular kernel approach with layered approach with a neat sketch. (06 Marks)
- c. List and explain the services provided by OS for the user and efficient operation of system. (06 Marks)

OR

- 2 a. Illustrate with a neat sketch, the process states and process control block. (08 Marks)
- b. Discuss the methods to implement message passing IPC in detail. (08 Marks)

Module-2

- 3 a. Discuss the benefits of multithreaded programming. (04 Marks)
- b. Consider the following set of processes with CPU burst time (in ms).

Process	Arrival time	Burst time
P1	0	6
P2	1	3
P3	2	1
P4	3	4

Compute the waiting time and average turnaround time for the above process using FCFS, SRT and RR (time quantum = 2ms) scheduling algorithm. (12 Marks)

OR

- 4 a. Illustrate with examples the Peterson's solution for critical section problem and prove that the mutual exclusion property is preserved. (08 Marks)
- b. Show how semaphore provides solution to reader writers problem. (08 Marks)

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Module-3

- 5 a. Define deadlock. Write short notes on 4 necessary conditions that arise deadlocks. (06 Marks)
 b. Assume that there are 5 processes P₀ through P₄ and 4 types of resources. At time T₀ we have the following state :

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2	1	5	2	0
P ₁	1	0	0	0	1	7	5	0				
P ₂	1	3	5	4	2	3	5	6				
P ₃	0	6	3	2	0	6	5	2				
P ₄	0	0	1	4	0	6	5	6				

Apply Banker's algorithm to answer the following :

- i) What is the content of need matrix?
 ii) Is the system in a safe state?
 iii) If a request from a process P₁(0, 4, 2, 0) arrives, can it be granted? (10 Marks)

OR

- 6 a. Write short notes on :
 i) External and internal fragmentation
 ii) Dynamic loading and linking. (04 Marks)
 b. Analyze the problem in simple paging technique and show how TLB is used to solve the problem. (08 Marks)
 c. Given the memory partitions of 200k, 700k 500k, 300k, 100k, 400k. Apply first fit and best fit to place 315k, 427k, 250k, 550k. (04 Marks)

Module-4

- 7 a. For the following page reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Calculate the page faults using FIFO and LRU for memory with 3 and 4 frames. (08 Marks)
 b. Explain demand paging in detail. (08 Marks)

OR

- 8 a. What do you mean by free space list? With suitable example, explain any 3 methods of free space list implementation. (08 Marks)
 b. Write short notes on linked and indexed allocation method with a neat diagram. (08 Marks)

Module-5

- 9 a. Given the following sequences 95, 180, 34, 119, 11, 123, 62, 64 with the head initially at track 50 and ending at track 199. What is the total disk traveled by the disk arm to satisfy the request using FCFS, SSTF, LOOK and CLOOK algorithm. (12 Marks)
 b. Write short notes on access matrix and its implementations. (04 Marks)

OR

- 10 a. Explain the components of Linux system with a neat diagram. (08 Marks)
 b. Describe briefly on Linux Kernel modules. (08 Marks)

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15CS71

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Web Technology And Its Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Briefly explain the history of markup languages. (04 Marks)
b. Write a note on XHTML and HTML5. (04 Marks)
c. Explain : i) <a> ii) iii) <p> iv) <div> elements with examples. (08 Marks)

OR

- 2 a. With an example explain different levels of style sheets. (08 Marks)
b. List the different selectors available in CSS and explain in detail (08 Marks)

Module-2

- 3 a. Explain different form widgets created with the <input> tag. (08 Marks)
b. Write HTML code for the following table :

Time Day		9.00 am to 1.15 pm	2.00 pm to 5.00 pm
Mon to Fri	Sub	Theory class	ML/WTA Lab
	FI	ABC/EFG/XYZ	AD block, 1 st *floor
Sat	Sub	Extra curricular activity	
	FI		

(08 Marks)

OR

- 4 a. Discuss the difference between relative and absolute positioning. (08 Marks)
b. What does floating an element do in CSS? How do you float an element? (08 Marks)

Module-3

- 5 a. Discuss the advantages and disadvantages of client – side scripting. (08 Marks)
b. Write a JavaScript code that displays text “VTU BELAGAVI” with increasing font size in the interval of 100 ms in blue color, when the font size reaches 50 pt it should stop. (08 Marks)

OR

- 6 a. With a neat diagram, explain client and server script execution. (08 Marks)
b. Write a PHP program to greet the user based on time. (08 Marks)

1 of 2

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Module-4

- 7 a. Explain \$GET and \$POST superglobal arrays. (08 Marks)
 b. How do you read or write a file on the server from PHP? Give example. (08 Marks)

OR

- 8 a. Write a PHP program to create a class **STUDENT** with the following specification.
 Data members : Name, Roll number, Average marks
 Member function : Read(getters) and write (setters)
 Use the above specification to read and print the information of 2 students. (08 Marks)
 b. How do you achieve data encapsulation in PHP? Give example. (08 Marks)

Module-5

- 9 a. What are HTTP cookies? How do you handle them in PHP? (08 Marks)
 b. Why is state is a problem for web applications? Explain. (08 Marks)

OR

- 10 a. What does \$() short and stand for in JQuery? Explain any 3 JQuery form selectors. (08 Marks)

- b. Write DTD for the following XML code.

```
<?XML version="1.0" encoding="ISO-8859-1"?>
<art>
```

```
  <painting id="290">
    <title> Balcony </title>
    <artist>
      <name> Manet</name>
      <nationality> France</nationality>
    </artist>
    <year> 1868 </year>
    <medium> oil on canvas </medium>
  </painting>
```

```
</art>
```

(08 Marks)

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15CS72

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019

Advanced Computer Architecture

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List the performance factors and system attributes. Explain how performance factors are influenced by system attributes. (08 Marks)
b. Explain the architecture of vector super computer with neat diagram. (08 Marks)

OR

- 2 a. What are the conditions of parallelism? Explain the types of data dependence. (06 Marks)
b. What are the metrics affecting scalability of a computer system? (06 Marks)
c. What are the important characteristics of parallel algorithms? (04 Marks)

Module-2

- 3 a. What are the characteristic of CISC and RISC architecture? (04 Marks)
b. What are the virtual memory models for multiprocessor system? (04 Marks)
c. Explain address translation mechanism using TLB and page table. (08 Marks)

OR

- 4 a. Explain typical superscalar RISC processor architecture. (08 Marks)
b. Explain inclusion, coherence and locality properties. (08 Marks)

Module-3

- 5 a. What is arbitration? Explain different types of arbitration. (08 Marks)
b. Explain sequential and weak consistency models. (08 Marks)

OR

- 6 a. What are the different techniques for branch prediction? Explain. (08 Marks)
b. Explain multiply pipeline design to multiply two 8-bit integers. (08 Marks)

Module-4

- 7 a. Explain routing in omega network. (08 Marks)
b. What are different vector – access memory schemes? Explain any two of them. (08 Marks)

OR

- 8 a. What are the implementation models of SIMD? Explain them. (08 Marks)
b. Explain four context-switching policies. (08 Marks)

Module-5

- 9 a. What are the issues in using shared-variable model? (08 Marks)
b. Explain different phases of parallelizing compiler with a diagram. (08 Marks)

OR

- 10 a. Explain testing algorithm for dependence testing. (08 Marks)
b. What are the principles of synchronization mechanisms? Explain them. (08 Marks)

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15CS73

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Specify the learning task for 'A checkers learning problem'. (03 Marks)
- b. Discuss the following with respect to the above,
 - (i) Choosing the training experience.
 - (ii) Choosing the target function and
 - (iii) Choosing a function approximation algorithm. (09 Marks)
- c. Comment on the issues in machine learning. (04 Marks)

OR

- 2 a. Write candidate elimination algorithm. Apply the algorithm to obtain the final version space for the training example. (10 Marks)

Sl. No.	Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

- b. Discuss about an unbiased Learner. (06 Marks)

Module-2

- 3 a. What is a decision tree & discuss the use of decision tree for classification purpose with an example. (08 Marks)
- b. Write and explain decision tree for the following transactions: (08 Marks)

Tid	Refund	Marital status	Taxable Income	Cheat
1	Yes	Single	125 K	No
2	No	Married	100 K	No
3	No	Single	70 K	No
4	Yes	Married	120 K	No
5	No	Divorced	95 K	Yes
6	No	Married	60 K	No
7	Yes	Divorced	220 K	No
8	No	Single	85 K	Yes
9	No	Married	75 K	No
10	No	Single	90 K	Yes

OR

- 4 a. For the transactions shown in the table compute the following :
 - (i) Entropy of the collection of transaction records of the table with respect to classification.
 - (ii) What are the information gain of a_1 and a_2 relative to the transactions of the table? (08 Marks)

Instance	1	2	3	4	5	6	7	8	9
a_1	T	T	T	F	F	F	F	T	F
a_2	T	T	F	F	T	T	F	F	T
Target class	+	+	-	+	-	-	-	+	-

- b. Discuss the decision learning algorithm. (04 Marks)
- c. List the issues of decision tree learning. (04 Marks)

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Module-3

- 5 a. Draw the perceptron network with the notation. Derive an equation of gradient descent rule to minimize the error. (08 Marks)
- b. Explain the importance of the terms : (i) Hidden layer (ii) Generalization (iii) Overfitting (iv) Stopping criterion (08 Marks)

OR

- 6 a. Discuss the application of Neural network which is used for learning to steer an autonomous vehicle. (06 Marks)
- b. Write an algorithm for back propagation algorithm which uses stochastic gradient descent method. Comment on the effect of adding momentum to the network. (10 Marks)

Module-4

- 7 a. What is Bayes theorem and maximum posterior hypothesis? (04 Marks)
- b. Derive an equation for MAP hypothesis using Bayes theorem. (04 Marks)
- c. Consider a football game between two rival teams: Team 0 and Team 1. Suppose Team 0 wins 95% of the time and Team 1 wins the remaining matches. Among the games won by team 0, only 30% of them come from playing on team 1's football field. On the other hand, 75% of the victories for team 1 are obtained while playing at home. If team 1 is to host the next match between the two teams, which team will most likely emerge as the winner? (08 Marks)

OR

- 8 a. Describe Brute-force MAP learning algorithm. (04 Marks)
- b. Discuss the Naïve Bayes classifier. (04 Marks)
- c. The following table gives data set about stolen vehicles. Using Naïve bayes classifier classify the new data (Red, SUV, Domestic) (08 Marks)

Table

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

Module-5

- 9 a. Write short notes on the following:
 (i) Estimating Hypothesis accuracy.
 (ii) Binomial distribution. (08 Marks)
- b. Discuss the method of comparing two algorithms. Justify with paired to tests method. (08 Marks)

OR

- 10 a. Discuss the K-nearest neighbor language. (04 Marks)
- b. Discuss locally weighted Regression. (04 Marks)
- c. Discuss the learning tasks and Q learning in the context of reinforcement learning. (08 Marks)

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15CS742

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Cloud Computing and Its Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain cloud computing reference model with neat diagram. (10 Marks)
b. Write a note on the challenges in cloud computing. (06 Marks)

OR

- 2 a. Explain Microsoft Hyper V architecture. (10 Marks)
b. Explain pros and cons of virtualization. (06 Marks)

Module-2

- 3 a. Explain community cloud and list out the benefits. (10 Marks)
b. Discuss about the economics of the cloud. (06 Marks)

OR

- 4 a. Explain the aneka framework overview. (10 Marks)
b. Discuss about the logical organization of an aneka cloud. (06 Marks)

Module-3

- 5 a. Explain the domain decomposition techniques for parallel computation. (10 Marks)
b. What is multiprocessing? Describe the different techniques for implementing multiprocessing. (06 Marks)

OR

- 6 a. Explain the computing categories for task computing. (06 Marks)
b. Explain reference model of a workflow system. (10 Marks)

Module-4

- 7 a. List out the open challenges in data intensive computing. (06 Marks)
b. Explain the Google Bigtable architecture. (10 Marks)

OR

- 8 a. Explain the map reduce programming model. (10 Marks)
b. Explain any three distributed file systems. (06 Marks)

Module-5

- 9 a. Write a note about the prominent cloud computing platforms. (06 Marks)
b. Explain the windows azure platform architecture. (10 Marks)

OR

- 10 a. Describe how cloud computing technology can be applied to remote ECG monitoring. (08 Marks)
b. Explain animoto media application that use cloud technologies. (08 Marks)

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15CS754

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Storage Area Networks

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is a data center? Explain key characteristics of data center elements with diagram. (08 Marks)
- b. What is a file system? Explain the process of mapping user files to the disk storage. (08 Marks)

OR

- 2 a. What is RAID? Explain the RAID levels with reference to nested RAID, RAID3, RAID5 with neat diagram. (08 Marks)
- b. With neat diagram, explain the structure of read and write operations with cache. (08 Marks)

Module-2

- 3 a. Explain FC connectivity options with relevant diagram. (08 Marks)
- b. Explain block-level storage virtualization with neat diagram. Explain VSAN in brief. (08 Marks)

OR

- 4 a. What is FCoE? Explain the components of FCoE with neat diagram. (08 Marks)
- b. What is NAS? Explain the benefits of NAS. (08 Marks)

Module-3

- 5 a. What is business continuity? Explain the BC Terminology in detail. (08 Marks)
- b. Explain Backup and Restore operations with neat diagram. (08 Marks)

OR

- 6 a. What is data deduplication? Explain the implementation of data deduplication. (08 Marks)
- b. Explain Synchronous + Asynchronous and Synchronous + Disk Buffered methods of three-site replication with neat diagram. (08 Marks)

Module-4

- 7 a. What is cloud computing? Explain the characteristics and benefits of cloud computing? (08 Marks)
- b. Explain the various cloud service models available. (08 Marks)

OR

- 8 a. Explain the public cloud and private cloud deployment models in cloud computing. (08 Marks)
- b. Explain the cloud computing infrastructure in detail. (08 Marks)

Module-5

- 9 a. Explain FC SAN security architecture with neat diagram. (08 Marks)
- b. Explain the concept of Kerberos with neat diagram. (08 Marks)

OR

- 10 a. Explain the storage management activities in detail. (08 Marks)
- b. Explain Information Lifecycle Management (ILM) in detail with challenges. (08 Marks)

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15CS72

Seventh Semester B.E. Degree Examination, June/July 2019 Advanced Computer Architectures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the evolution of computer architecture. (08 Marks)
 b. Explain with diagram the operational model of SIMD super computer. (08 Marks)

OR

- 2 a. Explain the Bernstein's conditions for parallelism. Detect the parallelism in the following code using Bernstein's conditions. (Assume no pipeline).
 $P_1 : C = D \times E$; $P_2 : M = G + C$; $P_3 : A = B + C$; $P_4 : C = L + M$; $P_5 : G \div E$. (08 Marks)
 b. With a diagram, explain the operation of tagged token data flow computer. (08 Marks)

Module-2

- 3 a. Distinguish between typical RISC and CISC process architectures. (08 Marks)
 b. With a diagrams, explain the models of a basic scalar computer system. (08 Marks)

OR

- 4 a. With a diagram, explain a typical superscalar RISC processor architecture consisting of an integer unit and a floating point unit. (10 Marks)
 b. With a diagram, explain the hierarchical memory technology. (06 Marks)

Module-3

- 5 a. Explain with diagram, the backplane bus specification. (08 Marks)
 b. With the diagrams, explain the central arbitration and distribution arbitration. (08 Marks)

OR

- 6 a. For the reservation table of a non-linear pipeline shown below :

	1	2	3	4	5	6
S ₁	X					X
S ₂		X			X	
S ₃			X			
S ₄				X		
S ₅		X				X

- i) What are the forbidden latencies? Write initial collision vector
 ii) Draw the state transition diagram
 iii) List all simple cycles and greedy cycles
 iv) Determine MAL. (10 Marks)
- b. Explain prefetch buffer and internal data forwarding mechanisms used in instruction pipelining. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-4

- 7 a. Explain crossbar networks and cross-point switch design in multiprocessor system. (08 Marks)
b. With necessary sketches, explain the cache-coherence problems in data sharing and in process migration. (08 Marks)

OR

- 8 a. With a diagram, explain the architecture of the connection machine CM-2. (08 Marks)
b. Explain the context-switching policies. (08 Marks)

Module-5

- 9 a. Explain the concurrent OOP and an actor model in object – oriented model. (08 Marks)
b. Explain the fairness policies and sole-access –protocols in the principles of synchronization. (08 Marks)

OR

- 10 a. What are the major hurdles of pipelining? Illustrate the branch hazards in detail. (08 Marks)
b. Explain the dynamic scheduling of a pipeline using Tomasulo`s algorithm. (08 Marks)

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15CS73

Seventh Semester B.E. Degree Examination, June/July 2019 Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define machine learning. Describe the steps in designing learning system. (08 Marks)
- b. Write Find-S algorithm and explain with example. (04 Marks)
- c. Explain List-Then-Eliminate algorithm. (04 Marks)

OR

- 2 a. List out any 5 applications of machine learning. (05 Marks)
- b. What do you mean by hypothesis space, instance space and version space? (03 Marks)
- c. Find the maximally general hypothesis and maximally specific hypothesis for the training examples given in the table using candidate elimination algorithm. (08 Marks)

Day	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

Module-2

- 3 Construct decision tree for the following data using ID3 algorithm.

Day	A1	A2	A3	Classification
1	True	Hot	High	No
2	True	Hot	High	No
3	False	Hot	High	Yes
4	False	Cool	Normal	Yes
5	False	Cool	Normal	Yes
6	True	Cool	High	No
7	True	Hot	High	No
8	True	Hot	Normal	Yes
9	False	Cool	Normal	Yes
10	False	Cool	High	No

(16 Marks)

OR

- 4 a. Explain the concept of decision tree learning. Discuss the necessary measure required to select the attributes for building a decision tree using ID3 algorithm. (08 Marks)
- b. Discuss the issues of avoiding over fitting the data, handling continuous data and missing values in decision trees. (08 Marks)

Module-3

- 5 a. Explain artificial neural network based on perception concept with diagram. (06 Marks)
- b. What is gradient descent and delta rule? Why stochastic approximation to gradient descent is needed? (04 Marks)
- c. Describe the multilayer neural network. Explain why back propagation algorithm is required. (06 Marks)

OR

- 6 a. Derive the back propagation rule considering the output layer and training rule for output unit weights. (08 Marks)
 b. What is squashing function & why is it needed? (04 Marks)
 c. List out and explain in briefly representation power of feed forward networks. (04 Marks)

Module-4

- 7 a. Explain maximum a posteriori (MAP) hypothesis using Bayes theorem. (06 Marks)
 b. Estimate conditional probabilities of each attributes {colour, legs, height, smelly} for the species classes: {M, H} using the data given in the table. Using these probabilities estimate the probability values for the new instance – (Colour = Green, Legs = 2, Height = Tall and Smelly = No) (10 Marks)

No	Colour	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	M
5	Green	2	Short	No	H
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

OR

- 8 a. Explain Naive Bayes classifier and Bayesian belief networks. (10 Marks)
 b. Prove that how maximum likelihood (Bayesian learning) can be used in any learning algorithms that are used to minimize the squared error between actual output hypothesis and predicted output hypothesis. (06 Marks)

Module-5

- 9 a. Explain locally weighted linear regression. (08 Marks)
 b. What do you mean by reinforcement learning? How reinforcement learning problem differs from other function approximation tasks. (05 Marks)
 c. Write down Q-learning algorithm. (03 Marks)

OR

- 10 a. What is instance based learning? Explain K-Nearest neighbour algorithm. (08 Marks)
 b. Explain sample error, true error, confidence intervals and Q-learning function. (08 Marks)

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15CS742

Seventh Semester B.E. Degree Examination, June/July 2019

Cloud Computing and its Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe cloud computing reference model. List any four characteristics and benefits of cloud computing. (08 Marks)
- b. Describe the three major milestones which have led to cloud computing. (06 Marks)
- c. Define service oriented computing and utility oriented computing. (02 Marks)

OR

- 2 a. What is virtualization? What are the characteristics of virtualized environments? (08 Marks)
- b. What is an Hypervisor? Explain how hardware virtualization can be achieved. (08 Marks)

Module-2

- 3 a. Classify the service offered by cloud computing. Explain any one of the service in detail. (08 Marks)
- b. With a neat diagram, describe the private cloud hardware and software stack. List the advantages of private cloud computing infrastructure. (08 Marks)

OR

- 4 a. Describe Aneka container. Explain briefly the three service offered by the Aneka container. (08 Marks)
- b. Describe the Aneka service model with a neat diagram of service life cycle. (08 Marks)

Module-3

- 5 a. Describe the relationship between a process and a thread. (08 Marks)
- b. Explain with an example, Domain Decomposition. Write Aneka code to create matrix product class. (08 Marks)

OR

- 6 a. What is task computing? Describe parameter sweep application with an example. (10 Marks)
- b. List and explain Aneka ready – to – use task libraries. (06 Marks)

Module-4

- 7 a. Define Data Intensive computing. List any six open challenges in Data Intensive computing. (08 Marks)
- b. Bring out the salient features of Map Reduce programming model with a neat diagram of Map Reduce compworkflow. (08 Marks)

OR

- 8 a. Explain the Google Big Table Architecture. (08 Marks)
- b. List and explain the parameters that can be controlled during execution of Aneka mapReduce Application. (08 Marks)

Module-5

- 9 a. Describe any four popular cloud computing products. Indicate their service type. (08 Marks)
- b. Describe in detail the “Simple Storage Service” offered by Amazon S3. (08 Marks)

OR

- 10 a. Explain online health monitoring system hosted in cloud. (08 Marks)
- b. What are dropbox and icloud? Which kind of problems do they solve by using cloud technologies? (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019
Object Oriented Modeling and Design

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. What is object oriented development? List and explain object oriented themes. (10 Marks)
- b. Define the following terms with examples:
 - i) Links and associations
 - ii) Multiplicity
 - iii) Association end names
 - iv) Ordering
 - v) Bag and sequence (10 Marks)
- 2 a. What is an aggregation? Explain aggregation versus associations and aggregation versus composition. (10 Marks)
- b. Explain the following terms with an examples:
 - i) Meta data
 - ii) Derived data
 - iii) Reification (06 Marks)
- c. Draw the state diagram for a telephone line. (04 Marks)
- 3 a. What do you mean by concurrency? Explain aggregation concurrency with a neat diagram. (08 Marks)
- b. What is an interaction model? Explain with a neat diagram sequence diagram for a online stock broker. (06 Marks)
- c. Explain the following terms with examples:
 - i) Include relationship
 - ii) Extend relationship
 - iii) Generalization (06 Marks)
- 4 a. List and explain the stages involved in software development. (10 Marks)
- b. List the steps to construct a domain class model and explain them briefly. (10 Marks)

PART – B

- 5 a. Explain the steps followed in constructing application interaction model. (10 Marks)
- b. With a neat diagram explain the architecture of ATM system. (07 Marks)
- c. Name the three kinds of controls for the external event in a software system. (03 Marks)
- 6 a. What is refactoring? Explain the tasks involved in design optimization. (10 Marks)
- b. What are the steps involved in improving the organization of a class design? Explain them briefly. (10 Marks)
- 7 a. What is a pattern? Lists the properties of pattern. (10 Marks)
- b. With a neat diagram, explain the publisher-subscriber design pattern with necessary implementation steps. (10 Marks)
- 8 a. Explain the structure and implementation steps of view handler pattern with a neat diagram. (10 Marks)
- b. With a neat diagram explain the counted pointer idiom. (10 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019
Embedded Computing Systems

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.*

PART – A

- 1 a. Define embedded computing system. Explain the embedded system design process. (10 Marks)
- b. Explain the design process for GPS moving map. (10 Marks)
- 2 a. Explain the format of ARM data processing instruction. (06 Marks)
- b. Differentiate between Von Neumann and Harvard architectures. (06 Marks)
- c. What is interrupt? With a neat diagram, explain the interrupt mechanism. (08 Marks)
- 3 a. Write the requirement chart of alarm clock. (06 Marks)
- b. Explain Bus with DMA controller. (06 Marks)
- c. Explain: (08 Marks)
 - i) Cross compiler
 - ii) Timer
 - iii) Logic analyzer
 - iv) Displays
- 4 a. Explain different types of performance measures on programs. (06 Marks)
- b. Explain program generation from compilation through loading. (06 Marks)
- c. Explain different program optimization techniques. (08 Marks)

PART – B

- 5 a. Explain the structure of process. (06 Marks)
- b. What are the factors to be considered for selection of scheduling algorithm? (06 Marks)
- c. What is RTOS? Explain the different services of RTOS. (08 Marks)
- 6 a. Explain L shaped usage distribution. (06 Marks)
- b. Explain: (06 Marks)
 - i) Message passing
 - ii) Counting semaphore
- c. With a neat sketch, explain shared memory communication. (08 Marks)
- 7 a. With a neat diagram, explain CAN frame format. (06 Marks)
- b. Explain the distributed embedded architecture. (06 Marks)
- c. With a neat diagram, explain various fields of IP packet. (08 Marks)
- 8 a. What is monitor program based firmware debugging? (06 Marks)
- b. Explain the different types of files generated in cross compilation. (06 Marks)
- c. What is simulator? Explain the features, advantages and limitations of simulator based debugging. (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019

Programming the Web

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is HTTP? Explain HTTP phases. Mention various methods and status codes of HTTP. (10 Marks)
- b. Give the standard structure of XHTML document. How line breaks, heading and fonts are handled in XHTML? (10 Marks)
- 2 a. Create XHTML document to describe a table with the following contents: The columns of the table must have the headings pine, maple, Oak and fir. The rows must have the labels average height, average width, typical life span and leaf type. Fill the data cells with some values. (10 Marks)
- b. Write an XHTML document that has six short paragraphs of text. Define three different paragraph styles p₁, p₂ and p₃. The p₁ style must use left and right margins of 20 pixels, a background color of pink and a foreground color of blue. The p₂ style must use left and right margins of 30 pixels, a background color of black and a foreground color of yellow. The p₃ style must use a text indent of 1 centimeter, a background color of green and a foreground color of white. The first and fourth paragraph must use p₁, the second and fifth must use p₂ and the third and sixth must use p₃. (10 Marks)
- 3 a. Explain the screen output and keyboard input method, with example. (10 Marks)
- b. Write XHTML document and JAVA script code to implement, to count the number of names in the given array that end in either "ie" or "y". (05 Marks)
- c. Write a note on character and character classes. (05 Marks)
- 4 a. Explain the basic concepts of event handling. List the events and their tag attributes. (12 Marks)
- b. With an example, explain absolute and relative positioning of elements in JAVA script. (08 Marks)

PART – B

- 5 a. What is the Document Type Definition (DTD)? Describe the approach to declare elements, entities and attributes. (08 Marks)
- b. Create an XML documents that lists advertisement for selling used cars. (06 Marks)
- c. With a neat diagram, explain transformation process by an XSLT processor. (06 Marks)
- 6 a. Write a perl program which creates a hash table containing country names keys and their capitals as values and perform the following:
 - i) Print all pair of values (country name and capital)
 - ii) Accept country name and print the capital of it. (10 Marks)
- b. With an example, explain how files are handled in PERL. (10 Marks)

- 7 a. Describe how files are created, read and write on the server system using PHP. (10 Marks)
b. Explain any six string function in PHP. (06 Marks)
c. Explain the different types of scalar types are available in PHP. (04 Marks)
- 8 a. Discuss the different pattern matching operations are available in ruby with example each. (08 Marks)
b. Build a rail's application to accept book information viz accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search result with proper headings. (12 Marks)

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10CS74

Seventh Semester B.E. Degree Examination, June/July 2019
Advanced Computer Architecture

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, selecting
at least TWO full questions from each part.*

PART – A

1.
 - a. Define instruction set architecture. Illustrate seven dimensions of ISA. (08 Marks)
 - b. Find the number of dies 350 mm wafer for a die that is 17.5mm on a side and find yield by assuming density of $0.5/\text{cm}^2$ and manufacturing complexity is 4. (04 Marks)
 - c. Explain the methods and observations to improve the performance of a system. (08 Marks)
2.
 - a. With data path explain classic five stage pipeline for a RISC processor. (06 Marks)
 - b. Explain the methods to reduce pipeline branch penalties. (06 Marks)
 - c. List types of exceptions and explain requirements on exceptions. (08 Marks)
3.
 - a. Define true data dependences and name data dependences. Explain all possible data hazards. (07 Marks)
 - b. Explain 2-bit branch prediction scheme with state diagram. (05 Marks)
 - c. With neat diagram, explain Tomasulo's approach for dynamic scheduling. (08 Marks)
4.
 - a. List the favours of multiple issue processor with basic VLIW approach. (08 Marks)
 - b. Illustrate how branch target buffer helps in reducing the branch penalties. (06 Marks)
 - c. Explain how speculation supports for register renaming. (06 Marks)

PART – B

5.
 - a. Explain Flynn's classification of computers. (06 Marks)
 - b. To achieve a speedup of 80 with 100 processor. What fractions of the original computation can be sequential? (04 Marks)
 - c. Explain directory based cache-coherence protocol. (06 Marks)
 - d. Write a note on memory consistency. (04 Marks)
6.
 - a. Derive the CPU execution time equation by considering memory stall cycles. (05 Marks)
 - b. Explain write strategy in first-level of the memory hierarchy. (05 Marks)
 - c. Explain how multilevel cache helps in reducing miss penalty. For 1000 memory references there are 40 misses in the first-level cache and 20 misses in the second-level cache. What are the various miss rates? Assume the miss penalty from the L2 cache to memory is 200 clock cycles, the hit time of the L2 cache is 10 clock cycles, the hit time of L1 is 1 clock cycle and there are 1.5 memory references per instruction what is the average memory access time and average stall cycles per instruction? (10 Marks)
7.
 - a. Write the typical multilevel memory hierarchical structure and define 3 C's of misses. (06 Marks)
 - b. Explain compiler optimization with example. (06 Marks)
 - c. Give the differences between SRAM and DRAM. (03 Marks)
 - d. Explain protection via virtual machines. (05 Marks)

- 8 a. Consider a loop for ($i = 1; i \leq 100; i++$)

```
{  
  A [i] = A[i] + B[i]; /*S1*/  
  B [i + 1] = C [i] + D [i]; /*S2*/  
}
```

What are the dependences between S1 and S2? Is the loop parallel? If not show how to make it parallel? **(06 Marks)**

- b. List the drawbacks of dependences. **(04 Marks)**

- c. Explain software pipelining with loop unrolling. **(10 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2019
Java and J2EE

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain three kinds of variables in Java. (06 Marks)
b. What are arrays? List out the three steps to create an array. (04 Marks)
c. Describe the process of building and running Java program with an example. (04 Marks)
d. Discuss different access specifiers in Java. (06 Marks)
- 2 a. Define an Applet. Explain the skeleton of an applet with example program. (08 Marks)
b. Explain the types of exceptions in Java. (06 Marks)
c. What is difference between a superclass and subclass? Write a program to demonstrate the same. (06 Marks)
- 3 a. What are threads? Explain how to make the class threadable. (07 Marks)
b. What is synchronization? Explain producer consumer problem with a program. (09 Marks)
c. Write short notes on sources of events. (04 Marks)
- 4 a. What are swing components? Explain atleast 4 swing components. (06 Marks)
b. What are containers? Explain a simple container. (06 Marks)
c. Write a short note on :
i) JTabbedPane
ii) JScrollPane
iii) JList
iv) JComboBox. (08 Marks)

PART – B

- 5 a. Explain JDBC process in detail. (12 Marks)
b. Write a short notes on :
i) J2EE
ii) J2SE
iii) ResultSet
iv) ResultSetMetaData. (08 Marks)
- 6 a. Explain the difference between the applet and servlet. (04 Marks)
b. With a diagram, explain servlet life cycle. (08 Marks)
c. With a program, explain handling HTTP requests and responses. (08 Marks)
- 7 a. Why we use JSP? Explain JSP tags. (08 Marks)
b. Explain Apache Tomcat with example program. (06 Marks)
c. Write a short notes on :
i) Session and cookies in JSP
ii) RMI. (06 Marks)
- 8 a. What is EJB? Explain three types of EJB that are suited to different purposes. (07 Marks)
b. Explain session beans with an example program. (05 Marks)
c. What are JAR file? Explain the benefits of JAR file format. (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019
Storage Area Networks

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Which core elements are essential for the basic functionality of a data center? Briefly explain with an order processing system. (12 Marks)
- b. What is disk service time? Explain different service times on a disk driver. (08 Marks)

- 2 a. Compare the RAID0, RAID1, RAID 1+0 and RAID 0+1 based on storage efficiency. Read performance write performance and write penalty. (12 Marks)
- b. Briefly explain Read hit and Read miss in cache. (08 Marks)

- 3 a. With neat diagram explain SCSI communication model. (10 Marks)
- b. What are different types of ports available in Fiber channel? Also mention its uses. (10 Marks)

- 4 a. What are the benefits of NAS. (10 Marks)
- b. Explain NAS File – sharing protocols. (10 Marks)

PART – B

- 5 a. Define Archives. Explain different types of Archives with an example. (10 Marks)
- b. Explain the concept of storage virtualization with figure. (10 Marks)

- 6 a. Explain BC planning life cycle. (12 Marks)
- b. With neat diagram explain LAN based back up topology. (08 Marks)

- 7 a. Explain different purposes of Local replica for source data. (10 Marks)
- b. Explain Host – based log shipping. (10 Marks)

- 8 Write a short note on : (20 Marks)
 - a. Assets
 - b. Threats
 - c. Vulnerability
 - d. Data encryption

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15CS81

Eighth Semester B.E. Degree Examination, June/July 2019 Internet of Things Technology

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is IOT? Explain in detail on Genesis of IOT. (08 Marks)
 b. What does IOT and digitalization mean? Elaborate on this concept. (04 Marks)
 c. Write a short note on "IOT impact in Real World". (04 Marks)

OR

- 2 a. Discuss IOT challenges. (08 Marks)
 b. With a neat diagram, explain architecture of IOT. (04 Marks)
 c. Explain Core IOT functional stack. (04 Marks)

Module-2

- 3 a. List and explain different types of sensors. (08 Marks)
 b. Elaborate on small physical objects and small virtual objects. (04 Marks)
 c. Explain "IOT Access Technologies". (04 Marks)

OR

- 4 a. Briefly explain protocol stack utilization IEEE 802.15.4. (08 Marks)
 b. What is SANET? Explain some advantages and disadvantages that a wireless based solution offers. (08 Marks)

Module-3

- 5 a. Explain working of IP as the IOT network layer. (08 Marks)
 b. Write note on Business case for IP. (04 Marks)
 c. Discuss need for optimization. (04 Marks)

OR

- 6 a. Describe application protocols for IOT. (08 Marks)
 b. Discuss the various methods used in IOT application transport. (08 Marks)

Module-4

- 7 a. What do you mean by data and analytics for IOT? Explain. (04 Marks)
 b. Discuss Bigdata analytics tools and technology. (04 Marks)
 c. With a case study relate the concept of securing IOT. (08 Marks)

OR

- 8 a. Explain in detail how IT and OT security practices and systems vary in real time. (08 Marks)
 b. Discuss OCTAVE and FAIR formal risk analysis. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-5

- 9 a. Give a brief note on Arduino UNO. (04 Marks)
b. With a neat diagram, explain Raspberry Pi board. (04 Marks)
c. With a neat diagram, explain wireless temperature monitoring system using Raspberry Pi. (08 Marks)

OR

- 10 a. Explain in detail smart city IOT architecture. (08 Marks)
b. With the case study explain smart and connected cities using Raspberry Pi. (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019 Big Data Analytics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. How does the Hadoop MapReduce Data flow work for a word count program? Give an example. (08 Marks)
- b. Briefly explain HDFS Name Node Federation, NFS Gateway, Snapshots, Checkpoint and Backups. (08 Marks)

OR

- 2 a. What do you understand by HDFS? Explain its components with a neat diagram. (10 Marks)
- b. Bring out the concepts of HDFS block replication, with an example. (06 Marks)

Module-2

- 3 a. Explain Apache Squoop Import and Export method with neat diagrams. (10 Marks)
- b. Explain with a neat diagram, the Apache Oozie work flow for Hadoop architecture. (06 Marks)

OR

- 4 a. How do you run Map Reduce and Message Passing Interface (MPI) on YARN architecture? Discuss. (10 Marks)
- b. What do you understand by YARN Distributed-Shell? (06 Marks)

Module-3

- 5 a. Write any four Business Intelligence Application for various sectors. (08 Marks)
- b. Explain the star schema design of Data Warehousing with an example. (06 Marks)
- c. What is Confusion Matrix? (02 Marks)

OR

- 6 a. Explain CRISP-DM cycle with a neat diagram. (08 Marks)
- b. What do you understand by the term Data Visualization? How is it important in Big data Analytics? (05 Marks)
- c. Differentiate between Data Mining and Data Warehousing. (03 Marks)

Module-4

- 7 a. What is a splitting variable? Describe three criteria for choosing a splitting variable. (04 Marks)
- b. List some of the advantages and disadvantages of Regression Model. (04 Marks)
- c. Create a decision tree for the following data set.

Age	Job	House	Credit	Loan Approved
Young	False	No	Fair	No
Young	False	No	Good	No
Young	True	No	Good	Yes
Young	True	Yes	Fair	Yes
Young	False	No	Fair	No

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Age	Job	House	Credit	Loan Approved
Middle	False	No	Fair	No
Middle	False	No	Good	No
Middle	True	Yes	Good	Yes
Middle	False	Yes	Excellent	Yes
Middle	False	Yes	Excellent	Yes
Old	False	Yes	Excellent	Yes
Old	False	Yes	Good	Yes
Old	True	No	Good	Yes
Old	True	No	Excellent	Yes
Old	False	No	Fair	No

Then solve the following problem using the model:

Age	Job	House	Credit	Loan Approved
Young	False	False	Good	???

(08 Marks)

OR

- 8 a. Explain the design principles of an Artificial Neural Network. (08 Marks)
 b. How does the Apriori Algorithm work? Apply the same for the following example.

T _{id}	List of Item-IDs
T ₁₀₀	I ₁ , I ₂ , I ₅
T ₂₀₀	I ₂ , I ₄
T ₃₀₀	I ₂ , I ₃
T ₄₀₀	I ₁ , I ₂ , I ₄
T ₅₀₀	I ₁ , I ₃
T ₆₀₀	I ₂ , I ₃
T ₇₀₀	I ₁ , I ₃
T ₈₀₀	I ₁ , I ₂ , I ₃ , I ₅
T ₉₀₀	I ₁ , I ₂ , I ₃

Assume the support count = 2.

(08 Marks)

Module-5

- 9 a. What is Naïve Bayes Technique? Explain its model. (05 Marks)
 b. What is a Support Vector Machine? Explain its model. (08 Marks)
 c. Mention the 3-step process of Text Mining. (03 Marks)

OR

- 10 a. Explain briefly the three different types of web mining. (06 Marks)
 b. Compute the rank values for the Nodes for the following network shown in Fig.Q10(b), which is the Highest ranked node. Solve the same with eight iterations.

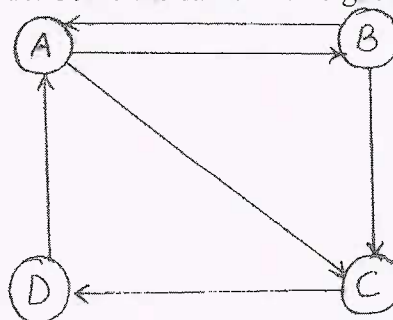


Fig.Q10(b)

(10 Marks)

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15CS832

Eighth Semester B.E. Degree Examination, June/July 2019

Modern Interface Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the Importance and Benefits of good user Interface Design. (04 Marks)
- b. Write any four differences between GUI and Webpage Design. (04 Marks)
- c. Explain in detail, the characteristics of GUI. (08 Marks)

OR

- 2 a. Explain the concept of Direct Manipulation for Graphical Systems. (04 Marks)
- b. Discuss the characteristics of Intranet and Internet and bring out the differences between them. (04 Marks)
- c. Discuss the general principles of User Interface Design (any 8). (08 Marks)

Module-2

- 3 a. List and explain the five commandments in designing for people. (06 Marks)
- b. Describe in detail, the important human characteristics in user Interface Design (any five). (10 Marks)

OR

- 4 a. Explain the common usability problems in web based systems. (06 Marks)
- b. Explain the techniques for determining the user requirements using Indirect methods. (10 Marks)

Module-3

- 5 a. Explain the structure of Menus with illustrations. (06 Marks)
- b. Describe the components of a Web Navigation System with illustration. (10 Marks)

OR

- 6 a. Describe the functions of Menus. (06 Marks)
- b. List all kinds of Graphical Menus and explain any one in detail. (10 Marks)

Module-4

- 7 a. Explain the components of a window with example. (08 Marks)
- b. Discuss briefly about the types of windows with examples (any four). (08 Marks)

OR

- 8 a. Describe overlapping windows and tiled windows presentation styles with examples. (08 Marks)
- b. Explain the characteristics of touch Screen and keyboard. (08 Marks)

Module-5

- 9 a. Explain Radio Buttons and List Boxes selection controls. (08 Marks)
- b. Explain any two types of testing prototypes used in User Interface Design. (08 Marks)

OR

- 10 a. Explain Slider and Tree View operable controls. (08 Marks)
- b. Explain Cognitive Walkthroughs, Think aloud Evaluations and Usability tests conducted in user Interface Design. (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
System Modeling and Simulation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. What is simulation? Explain the steps involved in simulation study along with flowchart. (10 Marks)
- b. A grocery store has one checkout counter. Customers arrive at the checkout counter at random from 1 to 8 minutes apart and each inter-arrival time has the same probability of occurrence. The service times vary from 1 to 6 minutes, with probability given below.

Service (minutes)	1	2	3	4	5	6
Probability	0.10	0.20	0.30	0.25	0.10	0.05

Simulate the arrival of 6 customers and calculate

- Average waiting time of customer
- Probability that a customer has to wait
- Probability of a server being Idle
- Average service time.

Use the following sequence of random numbers.

Random digit for Arrival	913	727	015	948	309	922
Random digit for service time	84	10	74	53	17	79

Assume that the first customer arrives at time 0. Depict the simulation in a tabular form.

(10 Marks)

- 2 a. Explain event scheduling algorithm by generating system snapshots at clock = t and clock = t₁. (05 Marks)
- b. What is world view? Explain three phases of activity scanning approach. (05 Marks)
- c. Six dump trucks are used to have coal from the entrance of a mine to a rail road. Each truck is loaded by one of the two loaders. After loading, truck immediately moves to the scale. to be weighted as soon as possible. Both the loaders and scale have first-come first-served waiting line for trucks. Travel time from a loader to scale is considered negligible. After being weighed, a truck begins travel time (during which time truck unloads) and then afterwards return to loader queue. The activities of loading, weighing and travel time are given in the following table.

Loading time	10	5	5	10	15	10	10
Weighing time	12	12	12	16	12	16	
Travel time	60	100	40	40	80		

Depict the simulation table and estimate the loader and scale utilization. Assume 5 trucks at loaders and one is at the scale, at time '0' stopping time T_F = 52 min. (10 Marks)

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- 3 a. Define the following terms:
 (i) Discrete random variable
 (ii) Continuous random variable
 (iii) Cumulative Distribution function (06 Marks)
- b. Explain Poisson Distribution (04 Marks)
- c. Define continuous distribution and explain uniform distribution, exponential distribution and normal distribution. (10 Marks)
- 4 a. List out the characteristics of queuing system and explain the following :
 (i) Queue behaviour and queue discipline
 (ii) Service time and service mechanism (10 Marks)
- b. Explain the Queuing Notations (05 Marks)
- c. Write a note on Networks of queues (05 Marks)

PART – B

- 5 a. Generate the Random numbers for these values with seed = 37, constant multiplier = 7, Increment 29 and modulus = 100. (08 Marks)
- b. Differentiate between Chi-square and Kolmogrov-Smirnov test. (04 Marks)
- c. Using X_0^2 test, test for hypothesis that the data given follows uniform distribution at $\alpha = 0.05$ the critical value is 16.9

O_i	8	8	10	9	12	8	10	14	10	11
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(08 Marks)

- 6 a. Explain in detail the inverse transform technique for exponential distribution. (10 Marks)
- b. List the steps involved in the development of a useful model of input data. (04 Marks)
- c. Explain how the method of histogram can be used to identify the shape of distribution. (06 Marks)
- 7 a. Briefly explain the measures of performance of a simulation system. (10 Marks)
- b. Explain the distinction between terminating (or) transient simulation and steady state simulation. Give examples. (10 Marks)
- 8 a. Explain with a neat diagram, model building verification and validation process. (10 Marks)
- b. Describe the 3 steps approach to validation by Naylor and Finger. (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019

Software Architecture

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. With the help of a neat block diagram of Architecture Business Cycle (ABC), explain in detail the different activities which are involved in creating a Software Architecture. (10 Marks)
- b. What makes a “good” architecture? (06 Marks)
- c. With the help of diagram, list common Software Architecture structures. (04 Marks)
- 2 a. Define Architectural style. Mention any four commonly used styles. (10 Marks)
- b. State the problem of KWIC (Keyword in Context Index System). propose implicit invocation and pipe and filter styles to implement a solution for the same. (10 Marks)
- 3 a. Explain the Quality attribute scenarios for availability and modifiability. (10 Marks)
- b. Explain modifiability and performance tactics of prevent ripple effects and resource management. (10 Marks)
- 4 a. Explain the structure components and consequences of black board system. (10 Marks)
- b. Explain the dynamic scenarios and implementation details of Layer Architecture design pattern. (10 Marks)

PART – B

- 5 a. What do you mean by broker Architecture? Explain the dynamic scenarios of Broken System. (10 Marks)
- b. Explain with a neat diagram implementation details of Model View Controller (MVC). (10 Marks)
- 6 a. What is PAC (Presentation, Abstraction and Control) pattern? Explain three level structure of PAC. (10 Marks)
- b. Explain the CRC and static structure of micro Kernel system. (10 Marks)
- 7 a. Enumerate the implementation steps of reflection pattern. (10 Marks)
- b. Explain Master-Slave design pattern. (10 Marks)
- 8 a. What is Attribute-Driven Design (ADD)? Explain the steps involved in ADD. (10 Marks)
- b. What is documenting view? Explain the steps involved in documenting interfaces. (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
Information and Network Security

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain the elements and components of enterprise information security policy. (10 Marks)
- b. What is contingency planning? Explain in detail incident response planning. (10 Marks)
- 2 a. What is firewall? Explain the packet filtering firewall. (08 Marks)
- b. With a neat diagram, explain the screened subnet firewall with DMZ. (06 Marks)
- c. What is VPN? Explain the tunnel mode of implementing a VPN. (06 Marks)
- 3 a. What is IDS? Explain network based intrusion detection system. Also mention its advantages and disadvantages. (08 Marks)
- b. Explain the signature based IDP's method used to monitor and evaluate the network traffic. (06 Marks)
- c. Explain Honey pots. (06 Marks)
- 4 a. What is cryptography? Explain the vernal cipher method used to encrypt the plaintext. Apply the same method to encrypt the plaintext COMPUTER SECURITY using one time pad INFORMATION WORLD. (08 Marks)
- b. Differentiate between symmetric and asymmetric encryption. (04 Marks)
- c. Explain the different categories of attacks on the cryptosystem. (08 Marks)

PART – B

- 5 a. Define a attack? Explain the different types of active and passive attacks. (07 Marks)
- b. Explain the Kerberos version 4 message exchanges. (08 Marks)
- c. With a neat diagram, explain the various fields of X.509 certificate format. (05 Marks)
- 6 a. With a neat diagram, explain the authentication and confidentiality services provided by PGP. (10 Marks)
- b. Explain the different MIME content types. (10 Marks)
- 7 a. What is security association? Explain the different parameters associated with SA. (08 Marks)
- b. Explain the anti-replay mechanism. (05 Marks)
- c. Explain the format of an ESP packet in IP security. (07 Marks)
- 8 a. With a neat diagram, explain the operation of SSL record protocol. (08 Marks)
- b. Explain the different participants in SET system. (06 Marks)
- c. Explain the construction of dual signature in SET protocol. (06 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019

Software Testing

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Define the following interms of software testing:
(i) Error (ii) Fault (iii) Failure (iv) Incident (v) Test case (05 Marks)
- b. Explain functional and structural testing. (05 Marks)
- c. Write a program for commission problem, problem statement is defined as follows: Rifle sales person in former Arizona territory sold rifle locks, Stocks and Barrels. Locks cost \$45, Stock cost \$30, and Barrels cost \$25. Sales person had to sell at least one complete rifle per month and production limits where such that the sales person could sell in month was 70 locks, 80 stocks and 90 Barrels. At the end of the month sales person sent a very short telegram showing locks sold to indicate completion of sale. The commission is as follows : 10% upto \$1000, 15% on the next \$800 and 20% on any sales of excess of \$1800. (10 Marks)
- 2 a. Explain weak normal, strong normal, weak robust and strong robust equivalence class techniques by considering Nextdata function as an example with test cases for each of the above. (10 Marks)
- b. Explain Robustness, worst case testing in the context of boundary value analysis. (10 Marks)
- 3 a. Write structured triangle program, draw the program graph of triangle program. (10 Marks)
- b. Define DD-paths and find all the paths for given graph using McCabe's basis path method. [Refer Fig.Q3(b)] (10 Marks)

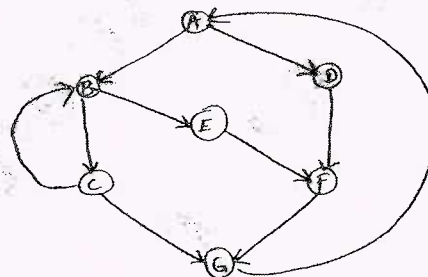


Fig.Q3(b)

- 4 a. With an example explain topdown integration and bottom up integration testing. (10 Marks)
- b. Briefly explain about SATM system. Also draw context and ER diagram. (10 Marks)

PART – B

- 5 a. Explain about Client server testing. (10 Marks)
- b. Briefly explain about functional strategies for thread testing. (10 Marks)
- 6 a. With neat diagram, explain validation and verification activities. (08 Marks)
- b. Explain the basic principles process frame work. (12 Marks)

- 7 a. Define scaffolding, explain in detail distinguish between generic and specific scaffolding. (10 Marks)
- b. Write short note on:
(i) Test oracles
(ii) Capture and Replay (10 Marks)
- 8 Write short notes on:
a. Monitoring the process
b. Organizing the documents
c. Risk planning
d. Test and analysis reports (20 Marks)

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15CS71

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Web Technology And Its Applications

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

- 1 a. Briefly explain the history of markup languages. (04 Marks)
- b. Write a note on XHTML and HTML5. (04 Marks)
- c. Explain : i) <a> ii) iii) <p> iv) <div> elements with examples. (08 Marks)

OR

- 2 a. With an example explain different levels of style sheets. (08 Marks)
- b. List the different selectors available in CSS and explain in detail (08 Marks)

Module-2

- 3 a. Explain different form widgets created with the <input> tag. (08 Marks)
- b. Write HTML code for the following table :

Time Day		9.00 am to 1.15 pm	2.00 pm to 5.00 pm
Mon to Fri	Sub	Theory class	ML/WTA Lab
	FI	ABC/EFG/XYZ	AD block, 1 st *floor
Sat	Sub	Extra curricular activity	
	FI		

(08 Marks)

OR

- 4 a. Discuss the difference between relative and absolute positioning. (08 Marks)
- b. What does floating an element do in CSS? How do you float an element? (08 Marks)

Module-3

- 5 a. Discuss the advantages and disadvantages of client – side scripting. (08 Marks)
- b. Write a JavaScript code that displays text “VTU BELAGAVI” with increasing font size in the interval of 100 ms in blue color, when the font size reaches 50 pt it should stop. (08 Marks)

OR

- 6 a. With a neat diagram, explain client and server script execution. (08 Marks)
- b. Write a PHP program to greet the user based on time. (08 Marks)

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Module-4

- 7 a. Explain `$_GET` and `$_POST` superglobal arrays. (08 Marks)
 b. How do you read or write a file on the server from PHP? Give example. (08 Marks)

OR

- 8 a. Write a PHP program to create a class `STUDENT` with the following specification.
 Data members : Name, Roll number, Average marks
 Member function : Read(getters) and write (setters)
 Use the above specification to read and print the information of 2 students. (08 Marks)
 b. How do you achieve data encapsulation in PHP? Give example. (08 Marks)

Module-5

- 9 a. What are HTTP cookies? How do you handle them in PHP? (08 Marks)
 b. Why is state is a problem for web applications? Explain. (08 Marks)

OR

- 10 a. What does `$()` short and stand for in JQuery? Explain any 3 JQuery form selectors. (08 Marks)

- b. Write DTD for the following XML code.

```
<?XML version="1.0" encoding="ISO-8859-1"?>
```

```
<art>
```

```
  <painting id="290">
```

```
    <title> Balcony </title>
```

```
    <artist>
```

```
      <name> Manet</name>
```

```
      <nationality> France</nationality>
```

```
    </artist>
```

```
    <year> 1868 </year>
```

```
    <medium> oil on canvas </medium>
```

```
  </painting>
```

```
</art>
```

(08 Marks)

CBCS SCHEME

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15CS72

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Advanced Computer Architecture

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List the performance factors and system attributes. Explain how performance factors are influenced by system attributes. (08 Marks)
b. Explain the architecture of vector super computer with neat diagram. (08 Marks)

OR

- 2 a. What are the conditions of parallelism? Explain the types of data dependence. (06 Marks)
b. What are the metrics affecting scalability of a computer system? (06 Marks)
c. What are the important characteristics of parallel algorithms? (04 Marks)

Module-2

- 3 a. What are the characteristic of CISC and RISC architecture? (04 Marks)
b. What are the virtual memory models for multiprocessor system? (04 Marks)
c. Explain address translation mechanism using TLB and page table. (08 Marks)

OR

- 4 a. Explain typical superscalar RISC processor architecture. (08 Marks)
b. Explain inclusion, coherence and locality properties. (08 Marks)

Module-3

- 5 a. What is arbitration? Explain different types of arbitration. (08 Marks)
b. Explain sequential and weak consistency models. (08 Marks)

OR

- 6 a. What are the different techniques for branch prediction? Explain. (08 Marks)
b. Explain multiply pipeline design to multiply two 8-bit integers. (08 Marks)

Module-4

- 7 a. Explain routing in omega network. (08 Marks)
b. What are different vector – access memory schemes? Explain any two of them. (08 Marks)

OR

- 8 a. What are the implementation models of SIMD? Explain them. (08 Marks)
b. Explain four context-switching policies. (08 Marks)

Module-5

- 9 a. What are the issues in using shared-variable model? (08 Marks)
b. Explain different phases of parallelizing compiler with a diagram. (08 Marks)

OR

- 10 a. Explain testing algorithm for dependence testing. (08 Marks)
b. What are the principles of synchronization mechanisms? Explain them. (08 Marks)

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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Specify the learning task for 'A checkers learning problem'. (03 Marks)
- b. Discuss the following with respect to the above,
 - (i) Choosing the training experience.
 - (ii) Choosing the target function and
 - (iii) Choosing a function approximation algorithm. (09 Marks)
- c. Comment on the issues in machine learning. (04 Marks)

OR

- 2 a. Write candidate elimination algorithm. Apply the algorithm to obtain the final version space for the training example. (10 Marks)

Sl. No.	Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

- b. Discuss about an unbiased Learner. (06 Marks)

Module-2

- 3 a. What is a decision tree & discuss the use of decision tree for classification purpose with an example. (08 Marks)
- b. Write and explain decision tree for the following transactions: (08 Marks)

Tid	Refund	Marital status	Taxable Income	Cheat
1	Yes	Single	125 K	No
2	No	Married	100 K	No
3	No	Single	70 K	No
4	Yes	Married	120 K	No
5	No	Divorced	95 K	Yes
6	No	Married	60 K	No
7	Yes	Divorced	220 K	No
8	No	Single	85 K	Yes
9	No	Married	75 K	No
10	No	Single	90 K	Yes

OR

- 4 a. For the transactions shown in the table compute the following :
 - (i) Entropy of the collection of transaction records of the table with respect to classification.
 - (ii) What are the information gain of a_1 and a_2 relative to the transactions of the table? (08 Marks)

Instance	1	2	3	4	5	6	7	8	9
a_1	T	T	T	F	F	F	F	T	F
a_2	T	T	F	F	T	T	F	F	T
Target class	+	+	-	+	-	-	-	+	-

- b. Discuss the decision learning algorithm. (04 Marks)
- c. List the issues of decision tree learning. (04 Marks)

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Module-3

- 5 a. Draw the perceptron network with the notation. Derive an equation of gradient descent rule to minimize the error. (08 Marks)
- b. Explain the importance of the terms : (i) Hidden layer (ii) Generalization (iii) Overfitting (iv) Stopping criterion (08 Marks)

OR

- 6 a. Discuss the application of Neural network which is used for learning to steer an autonomous vehicle. (06 Marks)
- b. Write an algorithm for back propagation algorithm which uses stochastic gradient descent method. Comment on the effect of adding momentum to the network. (10 Marks)

Module-4

- 7 a. What is Bayes theorem and maximum posterior hypothesis? (04 Marks)
- b. Derive an equation for MAP hypothesis using Bayes theorem. (04 Marks)
- c. Consider a football game between two rival teams: Team 0 and Team 1. Suppose Team 0 wins 95% of the time and Team 1 wins the remaining matches. Among the games won by team 0, only 30% of them come from playing on team 1's football field. On the other hand, 75% of the victories for team 1 are obtained while playing at home. If team 1 is to host the next match between the two teams, which team will most likely emerge as the winner? (08 Marks)

OR

- 8 a. Describe Brute-force MAP learning algorithm. (04 Marks)
- b. Discuss the Naïve Bayes classifier. (04 Marks)
- c. The following table gives data set about stolen vehicles. Using Naïve bayes classifier classify the new data (Red, SUV, Domestic) (08 Marks)

Table

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

Module-5

- 9 a. Write short notes on the following:
 (i) Estimating Hypothesis accuracy.
 (ii) Binomial distribution. (08 Marks)
- b. Discuss the method of comparing two algorithms. Justify with paired to tests method. (08 Marks)

OR

- 10 a. Discuss the K-nearest neighbor language. (04 Marks)
- b. Discuss locally weighted Regression. (04 Marks)
- c. Discuss the learning tasks and Q learning in the context of reinforcement learning. (08 Marks)

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15CS742

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Cloud Computing and Its Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain cloud computing reference model with neat diagram. (10 Marks)
b. Write a note on the challenges in cloud computing. (06 Marks)

OR

- 2 a. Explain Microsoft Hyper V architecture. (10 Marks)
b. Explain pros and cons of virtualization. (06 Marks)

Module-2

- 3 a. Explain community cloud and list out the benefits. (10 Marks)
b. Discuss about the economics of the cloud. (06 Marks)

OR

- 4 a. Explain the aneka framework overview. (10 Marks)
b. Discuss about the logical organization of an aneka cloud. (06 Marks)

Module-3

- 5 a. Explain the domain decomposition techniques for parallel computation. (10 Marks)
b. What is multiprocessing? Describe the different techniques for implementing multiprocessing. (06 Marks)

OR

- 6 a. Explain the computing categories for task computing. (06 Marks)
b. Explain reference model of a workflow system. (10 Marks)

Module-4

- 7 a. List out the open challenges in data intensive computing. (06 Marks)
b. Explain the Google Bigtable architecture. (10 Marks)

OR

- 8 a. Explain the map reduce programming model. (10 Marks)
b. Explain any three distributed file systems. (06 Marks)

Module-5

- 9 a. Write a note about the prominent cloud computing platforms. (06 Marks)
b. Explain the windows azure platform architecture. (10 Marks)

OR

- 10 a. Describe how cloud computing technology can be applied to remote ECG monitoring. (08 Marks)
b. Explain animoto media application that use cloud technologies. (08 Marks)

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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Storage Area Networks

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is a data center? Explain key characteristics of data center elements with diagram. (08 Marks)
- b. What is a file system? Explain the process of mapping user files to the disk storage. (08 Marks)

OR

- 2 a. What is RAID? Explain the RAID levels with reference to nested RAID, RAID3, RAID5 with neat diagram. (08 Marks)
- b. With neat diagram, explain the structure of read and write operations with cache. (08 Marks)

Module-2

- 3 a. Explain FC connectivity options with relevant diagram. (08 Marks)
- b. Explain block-level storage virtualization with neat diagram. Explain VSAN in brief. (08 Marks)

OR

- 4 a. What is FCoE? Explain the components of FCoE with neat diagram. (08 Marks)
- b. What is NAS? Explain the benefits of NAS. (08 Marks)

Module-3

- 5 a. What is business continuity? Explain the BC Terminology in detail. (08 Marks)
- b. Explain Backup and Restore operations with neat diagram. (08 Marks)

OR

- 6 a. What is data deduplication? Explain the implementation of data deduplication. (08 Marks)
- b. Explain Synchronous + Asynchronous and Synchronous + Disk Buffered methods of three-site replication with neat diagram. (08 Marks)

Module-4

- 7 a. What is cloud computing? Explain the characteristics and benefits of cloud computing? (08 Marks)
- b. Explain the various cloud service models available. (08 Marks)

OR

- 8 a. Explain the public cloud and private cloud deployment models in cloud computing. (08 Marks)
- b. Explain the cloud computing infrastructure in detail. (08 Marks)

Module-5

- 9 a. Explain FC SAN security architecture with neat diagram. (08 Marks)
- b. Explain the concept of Kerberos with neat diagram. (08 Marks)

OR

- 10 a. Explain the storage management activities in detail. (08 Marks)
- b. Explain Information Lifecycle Management (ILM) in detail with challenges. (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019 Advanced Computer Architectures

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the evolution of computer architecture. (08 Marks)
- b. Explain with diagram the operational model of SIMD super computer. (08 Marks)

OR

- 2 a. Explain the Bernstein's conditions for parallelism. Detect the parallelism in the following code using Bernstein's conditions. (Assume no pipeline).
 $P_1 : C = D \times E ; P_2 : M = G + C ; P_3 : A = B + C ; P_4 : C = L + M ; P_5 : G \div E.$ (08 Marks)
- b. With a diagram, explain the operation of tagged token data flow computer. (08 Marks)

Module-2

- 3 a. Distinguish between typical RISC and CISC process architectures. (08 Marks)
- b. With a diagrams, explain the models of a basic scalar computer system. (08 Marks)

OR

- 4 a. With a diagram, explain a typical superscalar RISC processor architecture consisting of an integer unit and a floating point unit. (10 Marks)
- b. With a diagram, explain the hierarchical memory technology. (06 Marks)

Module-3

- 5 a. Explain with diagram, the backplane bus specification. (08 Marks)
- b. With the diagrams, explain the central arbitration and distribution arbitration. (08 Marks)

OR

- 6 a. For the reservation table of a non-linear pipeline shown below :

	1	2	3	4	5	6
S ₁	X					X
S ₂		X			X	
S ₃			X			
S ₄				X		
S ₅		X				X

- i) What are the forbidden latencies? Write initial collision vector
- ii) Draw the state transition diagram
- iii) List all simple cycles and greedy cycles
- iv) Determine MAL. (10 Marks)
- b. Explain prefetch buffer and internal data forwarding mechanisms used in instruction pipelining. (06 Marks)

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Module-4

- 7 a. Explain crossbar networks and cross-point switch design in multiprocessor system. (08 Marks)
b. With necessary sketches, explain the cache-coherence problems in data sharing and in process migration. (08 Marks)

OR

- 8 a. With a diagram, explain the architecture of the connection machine CM-2. (08 Marks)
b. Explain the context-switching policies. (08 Marks)

Module-5

- 9 a. Explain the concurrent OOP and an actor model in object – oriented model. (08 Marks)
b. Explain the fairness policies and sole-access –protocols in the principles of synchronization. (08 Marks)

OR

- 10 a. What are the major hurdles of pipelining? Illustrate the branch hazards in detail. (08 Marks)
b. Explain the dynamic scheduling of a pipeline using Tomasulo's algorithm. (08 Marks)

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15CS73

Seventh Semester B.E. Degree Examination, June/July 2019 Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- Define machine learning. Describe the steps in designing learning system. (08 Marks)
 - Write Find-S algorithm and explain with example. (04 Marks)
 - Explain List-Then-Eliminate algorithm. (04 Marks)

OR

- List out any 5 applications of machine learning. (05 Marks)
 - What do you mean by hypothesis space, instance space and version space? (03 Marks)
 - Find the maximally general hypothesis and maximally specific hypothesis for the training examples given in the table using candidate elimination algorithm. (08 Marks)

Day	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

Module-2

- Construct decision tree for the following data using ID3 algorithm.

Day	A1	A2	A3	Classification
1	True	Hot	High	No
2	True	Hot	High	No
3	False	Hot	High	Yes
4	False	Cool	Normal	Yes
5	False	Cool	Normal	Yes
6	True	Cool	High	No
7	True	Hot	High	No
8	True	Hot	Normal	Yes
9	False	Cool	Normal	Yes
10	False	Cool	High	No

(16 Marks)

OR

- Explain the concept of decision tree learning. Discuss the necessary measure required to select the attributes for building a decision tree using ID3 algorithm. (08 Marks)
 - Discuss the issues of avoiding over fitting the data, handling continuous data and missing values in decision trees. (08 Marks)

Module-3

- Explain artificial neural network based on perception concept with diagram. (06 Marks)
 - What is gradient descent and delta rule? Why stochastic approximation to gradient descent is needed? (04 Marks)
 - Describe the multilayer neural network. Explain why back propagation algorithm is required. (06 Marks)

OR

- 6 a. Derive the back propagation rule considering the output layer and training rule for output unit weights. (08 Marks)
 b. What is squashing function 3 why is it needed? (04 Marks)
 c. List out and explain in briefly representation power of feed forward networks. (04 Marks)

Module-4

- 7 a. Explain maximum a posteriori (MAP) hypothesis using Bayes theorem. (06 Marks)
 b. Estimate conditional probabilities of each attributes {colour, legs, height, smelly} for the species classes: {M, H} using the data given in the table. Using these probabilities estimate the probability values for the new instance – (Colour = Green, Legs = 2, Height = Tall and Smelly = No) (10 Marks)

No	Colour	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	M
5	Green	2	Short	No	H
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

OR

- 8 a. Explain Naive Bayes classifier and Bayesian belief networks. (10 Marks)
 b. Prove that how maximum likelihood (Bayesian learning) can be used in any learning algorithms that are used to minimize the squared error between actual output hypothesis and predicted output hypothesis. (06 Marks)

Module-5

- 9 a. Explain locally weighted linear regression. (08 Marks)
 b. What do you mean by reinforcement learning? How reinforcement learning problem differs from other function approximation tasks. (05 Marks)
 c. Write down Q-learning algorithm. (03 Marks)

OR

- 10 a. What is instance based learning? Explain K-Nearest neighbour algorithm. (08 Marks)
 b. Explain sample error, true error, confidence intervals and Q-learning function. (08 Marks)

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15CS742

Seventh Semester B.E. Degree Examination, June/July 2019

Cloud Computing and its Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe cloud computing reference model. List any four characteristics and benefits of cloud computing. (08 Marks)
- b. Describe the three major milestones which have led to cloud computing. (06 Marks)
- c. Define service oriented computing and utility oriented computing. (02 Marks)

OR

- 2 a. What is virtualization? What are the characteristics of virtualized environments? (08 Marks)
- b. What is an Hypervisor? Explain how hardware virtualization can be achieved. (08 Marks)

Module-2

- 3 a. Classify the service offered by cloud computing. Explain any one of the service in detail. (08 Marks)
- b. With a neat diagram, describe the private cloud hardware and software stack. List the advantages of private cloud computing infrastructure. (08 Marks)

OR

- 4 a. Describe Aneka container. Explain briefly the three service offered by the Aneka container. (08 Marks)
- b. Describe the Aneka service model with a neat diagram of service life cycle. (08 Marks)

Module-3

- 5 a. Describe the relationship between a process and a thread. (08 Marks)
- b. Explain with an example, Domain Decomposition. Write Aneka code to create matrix product class. (08 Marks)

OR

- 6 a. What is task computing? Describe parameter sweep application with an example. (10 Marks)
- b. List and explain Aneka ready - to - use task libraries. (06 Marks)

Module-4

- 7 a. Define Data Intensive computing. List any six open challenges in Data Intensive computing. (08 Marks)
- b. Bring out the salient features of Map Reduce programming model with a neat diagram of Map Reduce compworkflow. (08 Marks)

OR

- 8 a. Explain the Google Big Table Architecture. (08 Marks)
- b. List and explain the parameters that can be controlled during execution of Aneka mapReduce Application. (08 Marks)

Module-5

- 9 a. Describe any four popular cloud computing products. Indicate their service type. (08 Marks)
- b. Describe in detail the "Simple Storage Service" offered by Amazon S3. (08 Marks)

OR

- 10 a. Explain online health monitoring system hosted in cloud. (08 Marks)
- b. What are dropbox and icloud? Which kind of problems do they solve by using cloud technologies? (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019
Object Oriented Modeling and Design

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. What is object oriented development? List and explain object oriented themes. (10 Marks)
- b. Define the following terms with examples:
 - i) Links and associations
 - ii) Multiplicity
 - iii) Association end names
 - iv) Ordering
 - v) Bag and sequence (10 Marks)
- 2 a. What is an aggregation? Explain aggregation versus associations and aggregation versus composition. (10 Marks)
- b. Explain the following terms with an examples:
 - i) Meta data
 - ii) Derived data
 - iii) Reification (06 Marks)
- c. Draw the state diagram for a telephone line. (04 Marks)
- 3 a. What do you mean by concurrency? Explain aggregation concurrency with a neat diagram. (08 Marks)
- b. What is an interaction model? Explain with a neat diagram sequence diagram for a online stock broker. (06 Marks)
- c. Explain the following terms with examples:
 - i) Include relationship
 - ii) Extend relationship
 - iii) Generalization (06 Marks)
- 4 a. List and explain the stages involved in software development. (10 Marks)
- b. List the steps to construct a domain class model and explain them briefly. (10 Marks)

PART – B

- 5 a. Explain the steps followed in constructing application interaction model. (10 Marks)
- b. With a neat diagram explain the architecture of ATM system. (07 Marks)
- c. Name the three kinds of controls for the external event in a software system. (03 Marks)
- 6 a. What is refactoring? Explain the tasks involved in design optimization. (10 Marks)
- b. What are the steps involved in improving the organization of a class design? Explain them briefly. (10 Marks)
- 7 a. What is a pattern? Lists the properties of pattern. (10 Marks)
- b. With a neat diagram, explain the publisher-subscriber design pattern with necessary implementation steps. (10 Marks)
- 8 a. Explain the structure and implementation steps of view handler pattern with a neat diagram. (10 Marks)
- b. With a neat diagram explain the counted pointer idiom. (10 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019

Embedded Computing Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Define embedded computing system. Explain the embedded system design process. (10 Marks)
- b. Explain the design process for GPS moving map. (10 Marks)
- 2 a. Explain the format of ARM data processing instruction. (06 Marks)
- b. Differentiate between Von Neumann and Harvard architectures. (06 Marks)
- c. What is interrupt? With a neat diagram, explain the interrupt mechanism. (08 Marks)
- 3 a. Write the requirement chart of alarm clock. (06 Marks)
- b. Explain Bus with DMA controller. (06 Marks)
- c. Explain: (08 Marks)
 - i) Cross compiler
 - ii) Timer
 - iii) Logic analyzer
 - iv) Displays
- 4 a. Explain different types of performance measures on programs. (06 Marks)
- b. Explain program generation from compilation through loading. (06 Marks)
- c. Explain different program optimization techniques. (08 Marks)

PART - B

- 5 a. Explain the structure of process. (06 Marks)
- b. What are the factors to be considered for selection of scheduling algorithm? (06 Marks)
- c. What is RTOS? Explain the different services of RTOS. (08 Marks)
- 6 a. Explain L shaped usage distribution. (06 Marks)
- b. Explain: (06 Marks)
 - i) Message passing
 - ii) Counting semaphore
- c. With a neat sketch, explain shared memory communication. (08 Marks)
- 7 a. With a neat diagram, explain CAN frame format. (06 Marks)
- b. Explain the distributed embedded architecture. (06 Marks)
- c. With a neat diagram, explain various fields of IP packet. (08 Marks)
- 8 a. What is monitor program based firmware debugging? (06 Marks)
- b. Explain the different types of files generated in cross compilation. (06 Marks)
- c. What is simulator? Explain the features, advantages and limitations of simulator based debugging. (08 Marks)

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10CS73

Seventh Semester B.E. Degree Examination, June/July 2019

Programming the Web

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is HTTP? Explain HTTP phases. Mention various methods and status codes of HTTP. (10 Marks)
- b. Give the standard structure of XHTML document. How line breaks, heading and fonts are handled in XHTML? (10 Marks)
- 2 a. Create XHTML document to describe a table with the following contents: The columns of the table must have the headings pine, maple, Oak and fir. The rows must have the labels average height, average width, typical life span and leaf type. Fill the data cells with some values. (10 Marks)
- b. Write an XHTML document that has six short paragraphs of text. Define three different paragraph styles p₁, p₂ and p₃. The p₁ style must use left and right margins of 20 pixels, a background color of pink and a foreground color of blue. The p₂ style must use left and right margins of 30 pixels, a background color of black and a foreground color of yellow. The p₃ style must use a text indent of 1 centimeter, a background color of green and a foreground color of white. The first and fourth paragraph must use p₁, the second and fifth must use p₂ and the third and sixth must use p₃. (10 Marks)
- 3 a. Explain the screen output and keyboard input method, with example. (10 Marks)
- b. Write XHTML document and JAVA script code to implement, to count the number of names in the given array that end in either "ie" or "y". (05 Marks)
- c. Write a note on character and character classes. (05 Marks)
- 4 a. Explain the basic concepts of event handling. List the events and their tag attributes. (12 Marks)
- b. With an example, explain absolute and relative positioning of elements in JAVA script. (08 Marks)

PART – B

- 5 a. What is the Document Type Definition (DTD)? Describe the approach to declare elements, entities and attributes. (08 Marks)
- b. Create an XML documents that lists advertisement for selling used cars. (06 Marks)
- c. With a neat diagram, explain transformation process by an XSLT processor. (06 Marks)
- 6 a. Write a perl program which creates a hash table containing country names keys and their capitals as values and perform the following:
 - i) Print all pair of values (country name and capital)
 - ii) Accept country name and print the capital of it. (10 Marks)
- b. With an example, explain how files are handled in PERL. (10 Marks)

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- 7 a. Describe how files are created, read and write on the server system using PHP. (10 Marks)
b. Explain any six string function in PHP. (06 Marks)
c. Explain the different types of scalar types are available in PHP. (04 Marks)
- 8 a. Discuss the different pattern matching operations are available in ruby with example each. (08 Marks)
b. Build a rail's application to accept book information viz accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search result with proper headings. (12 Marks)

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10CS74

Seventh Semester B.E. Degree Examination, June/July 2019
Advanced Computer Architecture

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
at least TWO full questions from each part.*

PART – A

- 1 a. Define instruction set architecture. Illustrate seven dimensions of ISA. (08 Marks)
- b. Find the number of dies 350 mm wafer for a die that is 17.5mm on a side and find yield by assuming density of 0.5/cm² and manufacturing complexity is 4. (04 Marks)
- c. Explain the methods and observations to improve the performance of a system. (08 Marks)

- 2 a. With data path explain classic five stage pipeline for a RISC processor. (06 Marks)
- b. Explain the methods to reduce pipeline branch penalties. (06 Marks)
- c. List types of exceptions and explain requirements on exceptions. (08 Marks)

- 3 a. Define true data dependences and name data dependences. Explain all possible data hazards. (07 Marks)
- b. Explain 2-bit branch prediction scheme with state diagram. (05 Marks)
- c. With neat diagram, explain Tomasulo's approach for dynamic scheduling. (08 Marks)

- 4 a. List the favours of multiple issue processor with basic VLIW approach. (08 Marks)
- b. Illustrate how branch target buffer helps in reducing the branch penalties. (06 Marks)
- c. Explain how speculation supports for register renaming. (06 Marks)

PART – B

- 5 a. Explain Flynn's classification of computers. (06 Marks)
- b. To achieve a speedup of 80 with 100 processor. What fractions of the original computation can be sequential? (04 Marks)
- c. Explain directory based cache-coherence protocol. (06 Marks)
- d. Write a note on memory consistency. (04 Marks)

- 6 a. Derive the CPU execution time equation by considering memory stall cycles. (05 Marks)
- b. Explain write strategy in first-level of the memory hierarchy. (05 Marks)
- c. Explain how multilevel cache helps in reducing miss penalty. For 1000 memory references there are 40 misses in the first-level cache and 20 misses in the second-level cache. What are the various miss rates? Assume the miss penalty from the L2 cache to memory is 200 clock cycles, the hit time of the L2 cache is 10 clock cycles, the hit time of L1 is 1 clock cycle and there are 1.5 memory references per instruction what is the average memory access time and average stall cycles per instruction? (10 Marks)

- 7 a. Write the typical multilevel memory hierarchical structure and define 3 C's of misses. (06 Marks)
- b. Explain compiler optimization with example. (06 Marks)
- c. Give the differences between SRAM and DRAM. (03 Marks)
- d. Explain protection via virtual machines. (05 Marks)

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- 8 a. Consider a loop for ($i = 1; i \leq 100; i++$)

```
{  
  A [i] = A[i] + B[i]; /*S1*/  
  B [i + 1] = C [i] + D [i]; /*S2*/  
}
```

What are the dependences between S1 and S2? Is the loop parallel? If not show how to make it parallel? **(06 Marks)**

- b. List the drawbacks of dependences. **(04 Marks)**
c. Explain software pipelining with loop unrolling. **(10 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2019
Java and J2EE

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain three kinds of variables in Java. (06 Marks)
b. What are arrays? List out the three steps to create an array. (04 Marks)
c. Describe the process of building and running Java program with an example. (04 Marks)
d. Discuss different access specifiers in Java. (06 Marks)
- 2 a. Define an Applet. Explain the skeleton of an applet with example program. (08 Marks)
b. Explain the types of exceptions in Java. (06 Marks)
c. What is difference between a superclass and subclass? Write a program to demonstrate the same. (06 Marks)
- 3 a. What are threads? Explain how to make the class threadable. (07 Marks)
b. What is synchronization? Explain producer consumer problem with a program. (09 Marks)
c. Write short notes on sources of events. (04 Marks)
- 4 a. What are swing components? Explain atleast 4 swing components. (06 Marks)
b. What are containers? Explain a simple container. (06 Marks)
c. Write a short note on :
i) JTabbedPane
ii) JScrollPane
iii) JList
iv) JComboBox. (08 Marks)

PART – B

- 5 a. Explain JDBC process in detail. (12 Marks)
b. Write a short notes on :
i) J2EE
ii) J2SE
iii) ResultSet
iv) ResultSetMetaData. (08 Marks)
- 6 a. Explain the difference between the applet and servlet. (04 Marks)
b. With a diagram, explain servlet life cycle. (08 Marks)
c. With a program, explain handling HTTP requests and responses. (08 Marks)
- 7 a. Why we use JSP? Explain JSP tags. (08 Marks)
b. Explain Apache Tomcat with example program. (06 Marks)
c. Write a short notes on :
i) Session and cookies in JSP
ii) RMI. (06 Marks)
- 8 a. What is EJB? Explain three types of EJB that are suited to different purposes. (07 Marks)
b. Explain session beans with an example program. (05 Marks)
c. What are JAR file? Explain the benefits of JAR file format. (08 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2019
Storage Area Networks

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Which core elements are essential for the basic functionality of a data center? Briefly explain with an order processing system. (12 Marks)
- b. What is disk service time? Explain different service times on a disk driver. (08 Marks)

- 2 a. Compare the RAID0, RAID1, RAID 1+0 and RAID 0+1 based on storage efficiency. Read performance write performance and write penalty. (12 Marks)
- b. Briefly explain Read hit and Read miss in cache. (08 Marks)

- 3 a. With neat diagram explain SCSI communication model. (10 Marks)
- b. What are different types of ports available in Fiber channel? Also mention its uses. (10 Marks)

- 4 a. What are the benefits of NAS. (10 Marks)
- b. Explain NAS File – sharing protocols. (10 Marks)

PART – B

- 5 a. Define Archives. Explain different types of Archives with an example. (10 Marks)
- b. Explain the concept of storage virtualization with figure. (10 Marks)

- 6 a. Explain BC planning life cycle. (12 Marks)
- b. With neat diagram explain LAN based back up topology. (08 Marks)

- 7 a. Explain different purposes of Local replica for source data. (10 Marks)
- b. Explain Host – based log shipping. (10 Marks)

- 8 Write a short note on : (20 Marks)
 - a. Assets
 - b. Threats
 - c. Vulnerability
 - d. Data encryption

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15CS81

Eighth Semester B.E. Degree Examination, June/July 2019 Internet of Things Technology

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What is IOT? Explain in detail on Genesis of IOT. (08 Marks)
 b. What does IOT and digitalization mean? Elaborate on this concept. (04 Marks)
 c. Write a short note on "IOT impact in Real World". (04 Marks)

OR

- 2 a. Discuss IOT challenges. (08 Marks)
 b. With a neat diagram, explain architecture of IOT. (04 Marks)
 c. Explain Core IOT functional stack. (04 Marks)

Module-2

- 3 a. List and explain different types of sensors. (08 Marks)
 b. Elaborate on small physical objects and small virtual objects. (04 Marks)
 c. Explain "IOT Access Technologies". (04 Marks)

OR

- 4 a. Briefly explain protocol stack utilization IEEE 802.15.4. (08 Marks)
 b. What is SANET? Explain some advantages and disadvantages that a wireless based solution offers. (08 Marks)

Module-3

- 5 a. Explain working of IP as the IOT network layer. (08 Marks)
 b. Write note on Business case for IP. (04 Marks)
 c. Discuss need for optimization. (04 Marks)

OR

- 6 a. Describe application protocols for IOT. (08 Marks)
 b. Discuss the various methods used in IOT application transport. (08 Marks)

Module-4

- 7 a. What do you mean by data and analytics for IOT? Explain. (04 Marks)
 b. Discuss Bigdata analytics tools and technology. (04 Marks)
 c. With a case study relate the concept of securing IOT. (08 Marks)

OR

- 8 a. Explain in detail how IT and OT security practices and systems vary in real time. (08 Marks)
 b. Discuss OCTAVE and FAIR formal risk analysis. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-5

- 9 a. Give a brief note on Arduino UNO. (04 Marks)
b. With a neat diagram, explain Raspberry Pi board. (04 Marks)
c. With a neat diagram, explain wireless temperature monitoring system using Raspberry Pi. (08 Marks)

OR

- 10 a. Explain in detail smart city IOT architecture. (08 Marks)
b. With the case study explain smart and connected cities using Raspberry Pi. (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019

Big Data Analytics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. How does the Hadoop MapReduce Data flow work for a word count program? Give an example. (08 Marks)
- b. Briefly explain HDFS Name Node Federation, NFS Gateway, Snapshots, Checkpoint and Backups. (08 Marks)

OR

- 2 a. What do you understand by HDFS? Explain its components with a neat diagram. (10 Marks)
- b. Bring out the concepts of HDFS block replication, with an example. (06 Marks)

Module-2

- 3 a. Explain Apache Squoop Import and Export method with neat diagrams. (10 Marks)
- b. Explain with a neat diagram, the Apache Oozie work flow for Hadoop architecture. (06 Marks)

OR

- 4 a. How do you run Map Reduce and Message Passing Interface (MPI) on YARN architecture? Discuss. (10 Marks)
- b. What do you understand by YARN Distributed-Shell? (06 Marks)

Module-3

- 5 a. Write any four Business Intelligence Application for various sectors. (08 Marks)
- b. Explain the star schema design of Data Warehousing with an example. (06 Marks)
- c. What is Confusion Matrix? (02 Marks)

OR

- 6 a. Explain CRISP-DM cycle with a neat diagram. (08 Marks)
- b. What do you understand by the term Data Visualization? How is it important in Big data Analytics? (05 Marks)
- c. Differentiate between Data Mining and Data Warehousing. (03 Marks)

Module-4

- 7 a. What is a splitting variable? Describe three criteria for choosing a splitting variable. (04 Marks)
- b. List some of the advantages and disadvantages of Regression Model. (04 Marks)
- c. Create a decision tree for the following data set.

Age	Job	House	Credit	Loan Approved
Young	False	No	Fair	No
Young	False	No	Good	No
Young	True	No	Good	Yes
Young	True	Yes	Fair	Yes
Young	False	No	Fair	No

Age	Job	House	Credit	Loan Approved
Middle	False	No	Fair	No
Middle	False	No	Good	No
Middle	True	Yes	Good	Yes
Middle	False	Yes	Excellent	Yes
Middle	False	Yes	Excellent	Yes
Old	False	Yes	Excellent	Yes
Old	False	Yes	Good	Yes
Old	True	No	Good	Yes
Old	True	No	Excellent	Yes
Old	False	No	Fair	No

Then solve the following problem using the model:

Age	Job	House	Credit	Loan Approved
Young	False	False	Good	???

(08 Marks)

OR

- 8 a. Explain the design principles of an Artificial Neural Network. (08 Marks)
 b. How does the Apriori Algorithm work? Apply the same for the following example.

T _{id}	List of Item-IDs
T ₁₀₀	I ₁ , I ₂ , I ₅
T ₂₀₀	I ₂ , I ₄
T ₃₀₀	I ₂ , I ₃
T ₄₀₀	I ₁ , I ₂ , I ₄
T ₅₀₀	I ₁ , I ₃
T ₆₀₀	I ₂ , I ₃
T ₇₀₀	I ₁ , I ₃
T ₈₀₀	I ₁ , I ₂ , I ₃ , I ₅
T ₉₀₀	I ₁ , I ₂ , I ₃

Assume the support count = 2.

(08 Marks)

Module-5

- 9 a. What is Naïve Bayes Technique? Explain its model. (05 Marks)
 b. What is a Support Vector Machine? Explain its model. (08 Marks)
 c. Mention the 3-step process of Text Mining. (03 Marks)

OR

- 10 a. Explain briefly the three different types of web mining. (06 Marks)
 b. Compute the rank values for the Nodes for the following network shown in Fig.Q10(b), which is the Highest ranked node. Solve the same with eight iterations.

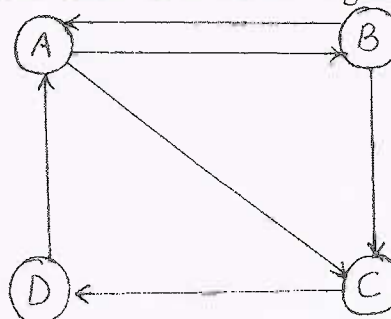


Fig.Q10(b)

(10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
Modern Interface Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the Importance and Benefits of good user Interface Design. (04 Marks)
 b. Write any four differences between GUI and Webpage Design. (04 Marks)
 c. Explain in detail, the characteristics of GUI. (08 Marks)

OR

- 2 a. Explain the concept of Direct Manipulation for Graphical Systems. (04 Marks)
 b. Discuss the characteristics of Intranet and Internet and bring out the differences between them. (04 Marks)
 c. Discuss the general principles of User Interface Design (any 8). (08 Marks)

Module-2

- 3 a. List and explain the five commandments in designing for people. (06 Marks)
 b. Describe in detail, the important human characteristics in user Interface Design (any five). (10 Marks)

OR

- 4 a. Explain the common usability problems in web based systems. (06 Marks)
 b. Explain the techniques for determining the user requirements using Indirect methods. (10 Marks)

Module-3

- 5 a. Explain the structure of Menus with illustrations. (06 Marks)
 b. Describe the components of a Web Navigation System with illustration. (10 Marks)

OR

- 6 a. Describe the functions of Menus. (06 Marks)
 b. List all kinds of Graphical Menus and explain any one in detail. (10 Marks)

Module-4

- 7 a. Explain the components of a window with example. (08 Marks)
 b. Discuss briefly about the types of windows with examples (any four). (08 Marks)

OR

- 8 a. Describe overlapping windows and tiled windows presentation styles with examples. (08 Marks)
 b. Explain the characteristics of touch Screen and keyboard. (08 Marks)

Module-5

- 9 a. Explain Radio Buttons and List Boxes selection controls. (08 Marks)
 b. Explain any two types of testing prototypes used in User Interface Design. (08 Marks)

OR

- 10 a. Explain Slider and Tree View operable controls. (08 Marks)
 b. Explain Cognitive Walkthroughs, Think aloud Evaluations and Usability tests conducted in user Interface Design. (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
System Modeling and Simulation

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What is simulation? Explain the steps involved in simulation study along with flowchart. (10 Marks)
- b. A grocery store has one checkout counter. Customers arrive at the checkout counter at random from 1 to 8 minutes apart and each inter-arrival time has the same probability of occurrence. The service times vary from 1 to 6 minutes, with probability given below.

Service (minutes)	1	2	3	4	5	6
Probability	0.10	0.20	0.30	0.25	0.10	0.05

Simulate the arrival of 6 customers and calculate

- Average waiting time of customer
- Probability that a customer has to wait
- Probability of a server being Idle
- Average service time.

Use the following sequence of random numbers.

Random digit for Arrival	913	727	015	948	309	922
Random digit for service time	84	10	74	53	17	79

Assume that the first customer arrives at time 0. Depict the simulation in a tabular form.

(10 Marks)

- 2 a. Explain event scheduling algorithm by generating system snapshots at clock = t and clock = t₁. (05 Marks)
- b. What is world view? Explain three phases of activity scanning approach. (05 Marks)
- c. Six dump trucks are used to have coal from the entrance of a mine to a rail road. Each truck is loaded by one of the two loaders. After loading, truck immediately moves to the scale, to be weighted as soon as possible. Both the loaders and scale have first-come first-served waiting line for trucks. Travel time from a loader to scale is considered negligible. After being weighed, a truck begins travel time (during which time truck unloads) and then afterwards return to loader queue. The activities of loading, weighing and travel time are given in the following table.

Loading time	10	5	5	10	15	10	10
Weighing time	12	12	12	16	12	16	
Travel time	60	100	40	40	80		

Depict the simulation table and estimate the loader and scale utilization. Assume 5 trucks at loaders and one is at the scale, at time '0' stopping time T_E = 52 min. (10 Marks)

- 3 a. Define the following terms:
 (i) Discrete random variable
 (ii) Continuous random variable
 (iii) Cumulative Distribution function (06 Marks)
 b. Explain Poisson Distribution (04 Marks)
 c. Define continuous distribution and explain uniform distribution, exponential distribution and normal distribution. (10 Marks)
- 4 a. List out the characteristics of queuing system and explain the following :
 (i) Queue behaviour and queue discipline (10 Marks)
 (ii) Service time and service mechanism (05 Marks)
 b. Explain the Queuing Notations (05 Marks)
 c. Write a note on Networks of queues (05 Marks)

PART – B

- 5 a. Generate the Random numbers for these values with seed = 37, constant multiplier = 7, Increment 29 and modulus = 100. (08 Marks)
 b. Differentiate between Chi-square and Kolmogrov-Smirnov test. (04 Marks)
 c. Using X_0^2 test, test for hypothesis that the data given follows uniform distribution at $\alpha = 0.05$ the critical value is 16.9

O_i	8	8	10	9	12	8	10	14	10	11
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(08 Marks)

- 6 a. Explain in detail the inverse transform technique for exponential distribution. (10 Marks)
 b. List the steps involved in the development of a useful model of input data. (04 Marks)
 c. Explain how the method of histogram can be used to identify the shape of distribution. (06 Marks)
- 7 a. Briefly explain the measures of performance of a simulation system. (10 Marks)
 b. Explain the distinction between terminating (or) transient simulation and steady state simulation. Give examples. (10 Marks)
- 8 a. Explain with a neat diagram, model building verification and validation process. (10 Marks)
 b. Describe the 3 steps approach to validation by Naylor and Finger. (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019

Software Architecture

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. With the help of a neat block diagram of Architecture Business Cycle (ABC), explain in detail the different activities which are involved in creating a Software Architecture. (10 Marks)
- b. What makes a “good” architecture? (06 Marks)
- c. With the help of diagram, list common Software Architecture structures. (04 Marks)
- 2 a. Define Architectural style. Mention any four commonly used styles. (10 Marks)
- b. State the problem of KWIC (Keyword in Context Index System), propose implicit invocation and pipe and filter styles to implement a solution for the same. (10 Marks)
- 3 a. Explain the Quality attribute scenarios for availability and modifiability. (10 Marks)
- b. Explain modifiability and performance tactics of prevent ripple effects and resource management. (10 Marks)
- 4 a. Explain the structure components and consequences of black board system. (10 Marks)
- b. Explain the dynamic scenarios and implementation details of Layer Architecture design pattern. (10 Marks)

PART – B

- 5 a. What do you mean by broker Architecture? Explain the dynamic scenarios of Broken System. (10 Marks)
- b. Explain with a neat diagram implementation details of Model View Controller (MVC). (10 Marks)
- 6 a. What is PAC (Presentation, Abstraction and Control) pattern? Explain three level structure of PAC. (10 Marks)
- b. Explain the CRC and static structure of micro Kernel system. (10 Marks)
- 7 a. Enumerate the implementation steps of reflection pattern. (10 Marks)
- b. Explain Master-Slave design pattern. (10 Marks)
- 8 a. What is Attribute-Driven Design (ADD)? Explain the steps involved in ADD. (10 Marks)
- b. What is documenting view? Explain the steps involved in documenting interfaces. (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
Information and Network Security

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain the elements and components of enterprise information security policy. (10 Marks)
- b. What is contingency planning? Explain in detail incident response planning. (10 Marks)
- 2 a. What is firewall? Explain the packet filtering firewall. (08 Marks)
- b. With a neat diagram, explain the screened subnet firewall with DMZ. (06 Marks)
- c. What is VPN? Explain the tunnel mode of implementing a VPN. (06 Marks)
- 3 a. What is IDS? Explain network based intrusion detection system. Also mention its advantages and disadvantages. (08 Marks)
- b. Explain the signature based IDP's method used to monitor and evaluate the network traffic. (06 Marks)
- c. Explain Honey pots. (06 Marks)
- 4 a. What is cryptography? Explain the vernal cipher method used to encrypt the plaintext. Apply the same method to encrypt the plaintext COMPUTER SECURITY using one time pad INFORMATION WORLD. (08 Marks)
- b. Differentiate between symmetric and asymmetric encryption. (04 Marks)
- c. Explain the different categories of attacks on the cryptosystem. (08 Marks)

PART – B

- 5 a. Define a attack? Explain the different types of active and passive attacks. (07 Marks)
- b. Explain the Kerberos version 4 message exchanges. (08 Marks)
- c. With a neat diagram, explain the various fields of X-509 certificate format. (05 Marks)
- 6 a. With a neat diagram, explain the authentication and confidentiality services provided by PGP. (10 Marks)
- b. Explain the different MIME content types. (10 Marks)
- 7 a. What is security association? Explain the different parameters associated with SA. (08 Marks)
- b. Explain the anti-replay mechanism. (05 Marks)
- c. Explain the format of an ESP packet in IP security. (07 Marks)
- 8 a. With a neat diagram, explain the operation of SSL record protocol. (08 Marks)
- b. Explain the different participants in SET system. (06 Marks)
- c. Explain the construction of dual signature in SET protocol. (06 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019

Software Testing

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

1. a. Define the following interms of software testing:
(i) Error (ii) Fault (iii) Failure (iv) Incident (v) Test case (05 Marks)
- b. Explain functional and structural testing. (05 Marks)
- c. Write a program for commission problem, problem statement is defined as follows:
Rifle sales person in former Arizona territory sold rifle locks, Stocks and Barrels. Locks cost \$45, Stock cost \$30, and Barrels cost \$25. Sales person had to sell at least one complete rifle per month and production limits where such that the sales person could sell in month was 70 locks, 80 stocks and 90 Barrels. At the end of the month sales person sent a very short telegram showing locks sold to indicate completion of sale. The commission is as follows : 10% upto \$1000, 15% on the next \$800 and 20% on any sales of excess of \$1800. (10 Marks)
2. a. Explain weak normal, strong normal, weak robust and strong robust equivalence class techniques by considering Nextdata function as an example with test cases for each of the above. (10 Marks)
- b. Explain Robustness, worst case testing in the context of boundary value analysis. (10 Marks)
3. a. Write structured triangle program, draw the program graph of triangle program. (10 Marks)
- b. Define DD-paths and find all the paths for given graph using McCabe's basis path method. [Refer Fig.Q3(b)] (10 Marks)

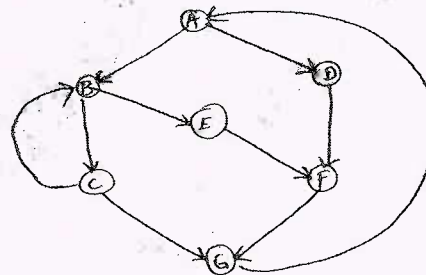


Fig.Q3(b)

4. a. With an example explain topdown integration and bottom up integration testing. (10 Marks)
- b. Briefly explain about SATM system. Also draw context and ER diagram. (10 Marks)

PART - B

5. a. Explain about Client server testing. (10 Marks)
- b. Briefly explain about functional strategies for thread testing. (10 Marks)
6. a. With neat diagram, explain validation and verification activities. (08 Marks)
- b. Explain the basic principles process frame work. (12 Marks)

- 7 a. Define scaffolding, explain in detail distinguish between generic and specific scaffolding. (10 Marks)
- b. Write short note on:
(i) Test oracles
(ii) Capture and Replay (10 Marks)
- 8 Write short notes on:
a. Monitoring the process
b. Organizing the documents
c. Risk planning
d. Test and analysis reports (20 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2019
Software Testing

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.*

PART - A

- 1 a. Define the following interms of software testing:
(i) Error (ii) Fault (iii) Failure (iv) Incident (v) Test case (05 Marks)
- b. Explain functional and structural testing. (05 Marks)
- c. Write a program for commission problem, problem statement is defined as follows:
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- 2 a. Explain weak normal, strong normal, weak robust and strong robust equivalence class techniques by considering Nextdata function as an example with test cases for each of the above. (10 Marks)
- b. Explain Robustness, worst case testing in the context of boundary value analysis. (10 Marks)
- 3 a. Write structured triangle program, draw the program graph of triangle program. (10 Marks)
- b. Define DD-paths and find all the paths for given graph using McCabe's basis path method. [Refer Fig.Q3(b)] (10 Marks)

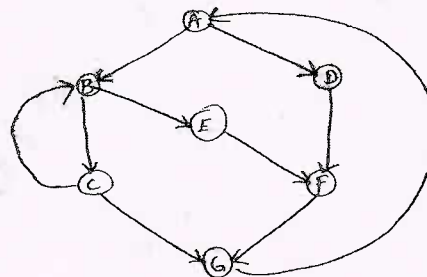


Fig.Q3(b)

- 4 a. With an example explain topdown integration and bottom up integration testing. (10 Marks)
- b. Briefly explain about SATM system. Also draw context and ER diagram. (10 Marks)

PART - B

- 5 a. Explain about Client server testing. (10 Marks)
- b. Briefly explain about functional strategies for thread testing. (10 Marks)
- 6 a. With neat diagram, explain validation and verification activities. (08 Marks)
- b. Explain the basic principles process frame work. (12 Marks)

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