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18CS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship for IT Industry

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 management? List the functional areas of management and explain any two in detail. **(10 Marks)**

b. Explain the managerial skills and the skill-mix required at various levels of management. **(06 Marks)**

c. Write a note on need and importance of staffing. **(04 Marks)**

OR

2 a. Discuss the importance of planning. Briefly explain the general steps involved in planning. **(10 Marks)**

b. Briefly explain the different approaches of management. **(06 Marks)**

c. Define recruitment. List sources of recruitment. **(04 Marks)**

Module-2

3 a. What is motivation? Explain Maslow's need hierarchy theory of motivation. **(10 Marks)**

b. Explain major approaches of leadership. **(06 Marks)**

c. Differentiate between co-ordination and co-operation. **(04 Marks)**

OR

4 a. Define control. Briefly explain the methods of establishing control. **(08 Marks)**

b. Explain Herzberg's motivation – hygiene theory. **(08 Marks)**

c. Write a note no importance of communication. **(04 Marks)**

Module-3

5 a. Define entrepreneur. Explain the functions of entrepreneur. **(08 Marks)**

b. What are the barriers of an entrepreneur? **(06 Marks)**

c. Write a note on market and financial feasibility study. **(06 Marks)**

OR

6 a. Explain different type of entrepreneur. **(08 Marks)**

b. Discuss the growth of industrial entrepreneurship in India. **(06 Marks)**

c. Write a note on technical and social feasibility study. **(06 Marks)**

Module-4

7 a. What is a project? Explain in detail the various ways of project identification. **(08 Marks)**

b. Explain the significance of project report. List down the guidelines by planning commission. **(06 Marks)**

c. Write a note on functional areas of management–finance and accounting and human resources. **(06 Marks)**

OR

8 a. What is ERP? Explain the importance and need of a ERP for an organization. (08 Marks)
  b. Explain the factors involved in selection of a project. (06 Marks)
  c. Write a note on functional areas of management – marketing/sales and supply chain management. (06 Marks)

Module-5

9 a. Explain the steps involved in establishing micro and small enterprises. (10 Marks)
  b. Discuss the case study of air Deccan (Captain G.R Gopinath). (06 Marks)
  c. What is patent? List different types of patents. (04 Marks)

OR

10 a. Explain the following institutions :
  i) KIADB
  ii) KSSIDC
  iii) NSIC
  iv) KSFC
  v) DIC. (10 Marks)
  b. Discuss the case study of Infosgs (N.R. Narayana Murthy). (06 Marks)
  c. List the advantages of micro and small enterprises. (04 Marks)

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18CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Computer Networks and Security

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 the different transport services available to applications? Explain. **(07 Marks)**

b. Explain HTTP request and response message format. **(08 Marks)**

c. Write a note on FTP and discuss about FTP command and replies. **(05 Marks)**

OR

2 a. What are the steps involved between client and server in order to fetch 10 JPEG images, which are residing in the same server by using non-persistent HTTP connection. The URL for base HTML file is http : //www.xyz.edu/department/basc index. **(07 Marks)**

b. With a neat diagram and explain, explain how DNS server will interact to various DNS server hierarchically. **(05 Marks)**

c. Illustrate how user1 can send mail to user2, and how user2 receives the mail by using SMTP. **(08 Marks)**

Module-2

3 a. How multiplexing and demultiplexing for a connectionless oriented will be performed at transport layer? **(06 Marks)**

b. Describe the various fields of UDP segment and also explain about UDP checksum with an example. **(07 Marks)**

c. Explain how TCP provides a flow control service by using different variables. **(07 Marks)**

OR

4 a. Explain the operation of selective repeat protocol. **(06 Marks)**

b. Explain all the fields in a TCP segment. **(07 Marks)**

c. How TCP connection management is done for three way handshake by the client and server for establishing and closing a connection. Explain. **(07 Marks)**

Module-3

5 a. Explain distance vector algorithm with an example. **(08 Marks)**

b. Explain the three switching techniques in a router. **(06 Marks)**

c. Draw IPV_6 datagram format, mention the significance of each fields. **(06 Marks**

OR

6 a. Explain link state algorithm with an example. **(08 Marks)**

b. Describe the intra-AS routing protocol : RIP in detail. **(06 Marks)**

c. Discuss about uncontrolled flooding and controlled flooding in broadcast routing algorithm. **(06 Marks)**

Module-4

7 a. Classify the different network attacks and explain denial of service attack. **(07 Marks)**

b. What are the two different techniques used to protect network from attacks? Explain. **(07 Marks)**

c. Write the steps involved in Data Encryption Standard (DES) along with a diagram. **(06 Marks)**

OR

8 a. Explain key generation, encryption and decryption phases in RSA algorithm. Illustrate with an example. **(07 Marks)**

b. Explain the technique involved in Hash function for authentication along with a diagram. **(07 Marks)**

c. Discuss about packet filtering and proxy server with respect to firewalls. **(06 Marks)**

Module-5

9 a. What are the classification in multimedia network applications? Explain. **(08 Marks)**

b. What are the two types of loss anticipation schemes? Explain. **(07 Marks)**

c. What do you mean by a Jitter and how to remove the Jitter at the receiver for audio by fixed and adaptive play out delay? **(05 Marks)**

OR

10 a. Explain the working of CDN. **(08 Marks)**

b. Explain about HTTP streaming in case of streaming stored video. **(07 Marks)**

c. Discuss about the properties of audio and video in multimedia networking. **(05 Marks)**

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18CS53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Database Management System

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define the following terms :
i) Database
ii) DBMS catalog
iii) Entity
iv) Snapshot
v) Degree of a relationship. **(05 Marks)**

b. Explain types of end-users with suitable examples. **(05 Marks)**

c. List and explain advantages of using DBMS approach. **(10 Marks**

OR

2 a. Define the following terms
i) Cardinality
ii) Weak entity
iii) Program data independence
iv) Total participation
v) Value sets. **(05 Marks)**

b. Describe three schema architecture. Why do we need mappings between schema levels? **(05 Marks)**

c. Explain different types of attributes in ER model with suitable examples for each. **(10 Marks**

Module-2

3 a. Explain the entity integrity and referential integrity constraints. Why is each considered important. Give examples **(05 Marks)**

b. Discuss equijoin and natural join with suitable examples using relational algebra notation. **(05 Marks)**

c. Given the schema :
Passenger (pid, pname, pgender, pcity)
Agency (aid, anme, acity)
Flight (fid, fdate, time, src, dest)
Booking (pid, aid, fid, fdate)
Give relation algebra expression for the following :
i) Get the complete details of all flights to new Delhi
ii) Find only the flight numbers for passenger with paid 123 for flights to Chennai before 06/11/2020
iii) Find the passenger names for those who do not have any bookings in any flights
iv) Get the details of flights that are scheduled on both dates 01/12/2020 and 02/12/2020 at 16:00 hours
v) Find the details of all male passengers who are associated with jet agency. **(10 Marks)**

OR

4 a. Explain the ER to relational mapping algorithm with suitable example for each step. **(10 Marks)**

b. Write SQL query for the following database scheme :
Employee(employee_name, street, city)
Works (employee_name, company_name, salary)
Company(company_name, city)
Manages(employee_name, manager_name)

i) Find the names, street address, and cities of residence for all employees who work for `First Bank Corporation` and earn more than $10,000

ii) Find the names of all employees in the database who do not work for `First Bank Corporation`. Assume that all people work for exactly one company

iii) Find the names of all employees in the database who earn more that every employee of `Small Bank Corporation`. Assume that all people work for at most one company

iv) Find the name of the company that has the smallest payroll

v) Find the names of all employees in the database who live in the same cities and on the same streets as do their managers. **(10 Marks)**

Module-3

5 a. Explain cursors and its properties in embedded SQL with suitable example. **(05 Marks)**

b. How are triggers defined in SQL? Explain with example. **(05 Marks)**

c. Illustrate insert, delete, update, alter and drop statements in SQL. **(10 Marks)**

OR

6 a. With an example, explain stored procedures In SQL. **(05 Marks)**

b. Briefly explain types of JDBC drives. **(05 Marks)**

c. Illustrate aggregate functions in SQL. **(10 Marks)**

Module-4

7 a. Explain types of update ananalies with examples. **(05 Marks)**

b. Explain Armstrong inference rules. **(05 Marks)**

c. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples. **(10 Marks**

OR

8 a. What is functional dependency? Write an algorithm to find minimal cover for set of functional dependencies. Construct minimal cover m for set of functional dependencies which are : E : $\{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$ **(10 Marks)**

b. Consider the schema R = ABCD, subjected to FDs F = $\{A \rightarrow B, B \rightarrow C\}$, and the non-binary partition D1 = {ACD, AB, BC}. State whether D1 is a lossless decomposition? [give all steps in detail] **(10 Marks)**

Module-5

9 a. Define transaction. Discuss ACID properties. **(05 Marks)**

b. With a neat diagram explain transition diagram of a transaction. **(05 Marks)**

c. Why concurrency control and recovery are needed in DBMS? Explain types of problems that may occur when two simple transactions run concurrently. **(10 Marks)**

OR

10 a. When deadlock and starvation problem occur? Explain how these problems can be resolved. **(10 Marks)**

b. Briefly discuss the two-phase locking techniques for concurrency control. **(10 Marks)**

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18CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Automata Theory and Computability

Time: 3 hrs. Max. Marks: 100

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) Symbol **(04 Marks)**

b. Design a DFSM to accept each of the following language:
i) $L = \{w \in \{a, b\}^* ;$ w has all strings that ends with sub string abb $\}$
ii) $L = \{w;$ where $|w| \bmod 3 = 0$ where $\Sigma = \{a\}\}$
iii) $L = \{w \in \{a, b\}^*$ every a region in w is of even length.$\}$ **(09 Marks)**

c. Construct an equivalent DFA from the following given NFA using subset construction method. (Refer Fig.Q.1(c)) **(07 Marks)**

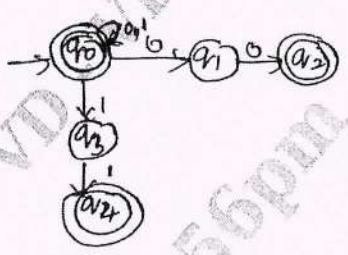

Fig.Q.1(c)

OR

2 a. Construct a minimum state automation equivalent to the FA given table

States	0	1
$\rightarrow q_0$	q_1	q_5
q_1	q_6	q_2
(q_2)	q_0	q_2
q_3	q_2	q_6
q_4	q_7	q_5
q_5	q_2	q_6
q_6	q_6	q_4
q_7	q_6	q_2

(10 Marks)

b. Consider the following NFA with ϵ-moves construct on equivalent DFA. **(10 Marks)**

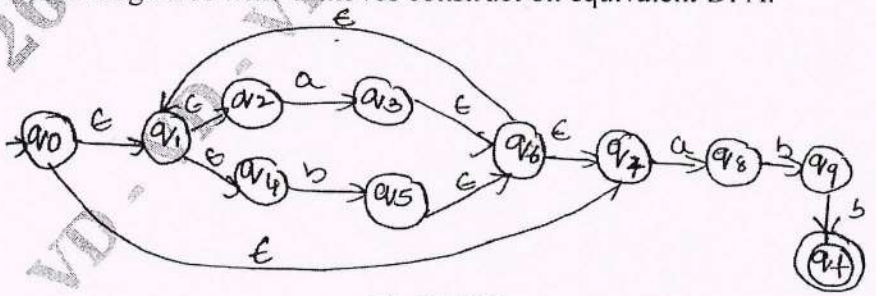

Fig.Q.2(b)

Module-2

3 a. Define Regular expression. Write RE for the following languages:
i) $L = \{a^n b^m \mid m+n \text{ is even}\}$
ii) $L = \{a^n b^m \mid m \geq 1 \;\; n \geq 1 \;\; nm \geq 3\}$
iii) $L = \{a^{2n} b^{2m} \mid n \geq 0, m \geq 0\}$ **(10 Marks)**

b. Construct an $\in$ - NFA for the regular expression $0 + 01^*$ **(05 Marks)**

c. Construct on FA for the regular expression $10 + (0 + 11)0^*1$ **(05 Marks)**

OR

4 a. State and prove pumping lemma theorem for regular languages. **(08 Marks)**

b. Prove that $L = \{a^p \mid p \text{ is a prime}\}$ is not a regular. **(08 Marks)**

c. List out closure properties of regular sets. **(04 Marks)**

Module-3

5 a. Define CFG. Write a CFG to specify
i) all string over {a, b} that are even and odd palindromes.
ii) $L = \{a^n b^{2n} \text{ over } \Sigma = \{a, b\} n \geq 1\}$ **(10 Marks)**

b. Write the procedure for removal of $\in$-productions. Simplify the following grammar.
$S \rightarrow aA \mid aBB$
$A \rightarrow aAA \mid \in$
$B \rightarrow bB \mid bbC$
$C \rightarrow B$ **(10 Marks)**

OR

6 a. Define PDA. Design a PDA for the language that accepts the string with $n_a(w) < n_b(w)$ where $w \in (a + b)^*$ and show the instantaneous description of the PDA on input abbab. **(10 Marks)**

b. What is CNF and GNF? Convert the following grammar into GNF.
$S \rightarrow AA \mid a$
$A \rightarrow SS \mid b$ **(10 Marks)**

Module-4

7 a. With a neat diagram, explain variant of turning machine. **(10 Marks)**

b. Construct a Turning machine that accept the language $0^n, 1^n$ where $n > 1$ and draw transition graph for Turning Machine. **(10 Marks)**

OR

8 a. Define Turning Machine with its tuples. **(04 Marks)**

b. Explain the working principle of Turning Machine with diagram. Design a Turing Machine to accept strings formed on {0, 1} and ending with 000. Write transition diagram and ID for w = 101000. **(16 Marks)**

Module-5

9 a. Explain restricted turing machines. **(08 Marks)**

b. Explain the following with example:
i) Decidability ii) Decidable languages iii) Undecidable languages. **(12 Marks)**

OR

10 Write a short note on:
a. Post correspondence problem
b. Halting problems in Turning Machine
c. Linear Bound Automation (LBA)
d. Classes of P and NP **(20 Marks)**

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18CS55

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Application Development using Python

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Demonstrate with example print( ), input( ) and string replication. **(06 Marks)**

b. Explain elif, for, while, break and continue statements in python with examples for each. **(10 Marks)**

c. Write a Python program to check whether a given number is even or odd. **(04 Marks)**

OR

2 a. How can we pass parameters in user defined functions? Explain with suitable example. **(05 Marks)**

b. Explain local and global scope with local and global variables. **(08 Marks)**

c. Demonstrate the concept of exception. Implement a code which prompts the user for Celsius temperature, convert the temperature to Fahrenheit, and print out the converted temperature by handling the exception. **(07 Marks)**

Module-2

3 a. What is list? Explain append( ), insert( ) and remove( ) methods with examples. **(08 Marks)**

b. How is tuple different from a list and which function is used to convert list to tuple. **(05 Marks)**

c. Create a function to print out a blank tic – tac – toe board. **(07 Marks)**

OR

4 a. Discuss get( ), item( ), keys( ) and values( ) Dictionary methods in python with examples. **(08 Marks)**

b. With example code explain join( ) and split( ) string methods. **(06 Marks)**

c. Develop a program to accept a sentence form the user and display the longest word of that sentence along with its length. **(06 Marks**

Module-3

5 a. What are regular expression? Describe question mark, star, plus-and dot Regex symbols with suitable python code snippet. **(09 Marks)**

b. With code snippet, explain saving variables using the shelve module and PPrint Pformat( ) functions. **(06 Marks)**

c. Write a program that reads a string with five characters which starts with 'a' and ends with 'z'. Print search successful if pattern matches string. **(05 Marks)**

OR

6 a. Explain functions of Shutil Module with examples. **(08 Marks)**

b. Explain buttons in the Debug control widow. **(05 Marks)**

c. What is meant by compressing files? Explain reading, extracting and creating ZIP files with code snippet. **(07 Marks)**

Module-4

7 a. What is class, object, attributes. Explain copy·copy( ) with an example. **(06 Marks)**

b. Demonstrate pure functions and modifiers with examples. **(08 Marks)**

c. Use the datetime module to write a program that gets the current date and prints that day of the week. **(06 Marks)**

OR

8 a. Explain operator overloading and polymorphism with examples. **(08 Marks)**

b. Illustrate the concepts of inheritance and class diagrams with examples. **(08 Marks)**

c. Write a function called print time that takes a time object and print it in the form hour : minute : second. **(04 Marks)**

Module-5

9 a. Explain parsing HTML with the BeautifulSoup Module with code snippet for creating finding an element and getting data. **(09 Marks)**

b. What methods do Selenium's web element object have for simulating mouse clicks and keyboard keys. Explain with python code snippet. **(06 Marks)**

c. Write a python program to access cell in a worksheet. **(05 Marks)**

OR

10 a. Write a program to get a list of all files with the ·pdf extension in the current working director and sort them. **(06 Marks)**

b. Demonstrate the json module with python program. **(06 Marks)**

c. What are the advantages of CSV files? Explain the Reader objects and Writer objects with python code. **(08 Marks)**

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18CS56

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
UNIX Programming

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 a architecture of UNIX operating system. **(10 Marks)**

b. List and explain the silent features of UNIX operating system. **(10 Marks)**

OR

2 a. What is a parent child relationship? With the help of neat diagram, explain UNIX file system. **(06 Marks)**

b. Explain any five file related commands with an example. **(10 Marks)**

c. With suitable example, bring out the differences between absolute and relative pathnames. **(04 Marks)**

Module-2

3 a. Which command is used for listing of file attributes? Explain the significance of each field. **(08 Marks)**

b. File current permissions are rw_r_xr_ _ specify chmod expression required to change for the following using both relative and absolute methods:
(i) rwxrwxrwx (ii) r_ _r_ _ _ _ _ (iii) _ _ _ _ _ _ _ _ _
(iv) _ _ _ r _ _ r _ _ (v) _ _ _ _ _ x _ w _ **(10 Marks)**

c. What is a shell? Briefly give the shell interpretive cycle. **(02 Marks)**

OR

4 a. With the help of an example, explain grep command with all the options. **(10 Marks)**

b. Explain three standard files supported by UNIX. **(06 Marks)**

c. What is the output for the following:
(i) ls [ijk]*doc (ii) [A – Z] ????* (iii) *·[!s][!h] (iv) *[!0 – 9] **(04 Marks)**

Module-3

5 a. Describe general UNIX file API's with syntax and explain each field in detail. **(10 Marks)**

b. Explain with a neat diagram memory layout of a C program and briefly discuss the different functions used for memory allocation. **(10 Marks)**

OR

6 a. Explain the UNIX Kernal support for process considering parent – child process show the related data structures. **(10 Marks)**

b. Bring out the differences between fork and vfork functions. **(05 Marks)**

c. Explain getrlimit and setrlimit function with prototype. **(05 Marks)**

Module-4

7 a. Explain setuid and setgid functions with example and explain various ways to change user ids. **(06 Marks)**

b. What are pipes? What are its limitations? Write a program to send data from parent to child over a pipe. **(08 Marks)**

c. What are Interpreter Files? Give the difference between interpreter files and interpreter. **(06 Marks)**

OR

8 a. What is a FIFO? With a neat diagram, explain client server communication using FIFO. **(08 Marks)**

b. What are stream pipe? What are the different ways to view stream pipes? **(04 Marks)**

c. Explain briefly with example: (i) message queue (ii) semaphores **(08 Marks)**

Module-5

9 a. What are signals? Mention different source of signals? Write a program to setup signal handlers for SIGINIT and SIGALRM. **(10 Marks)**

b. What are Daemon process? Enlist their characteristics. Also write a program to transform a normal user process into a Daemon process. **(10 Marks)**

OR

10 a. Explain the kill( ) API and alaram( ) API. **(10 Marks)**

b. Explain the Sigsetjmp and Siglongjmp functions with an example. **(10 Marks)**

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17CS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship for IT Industry

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. List and explain the functions of management. **(10 Marks)**
b. List and principles of management given by Henri Fayol. **(10 Marks)**

OR

2 a. Define and list the purpose of planning. **(10 Marks)**
b. List the principle of organization. **(10 Marks)**

Module-2

3 a. What is recruitment? Explain various sources of recruitment. **(10 Marks)**
b. Define Direction. List the principle of direction. **(10 Marks)**

OR

4 a. List the difference between Autocratic, Participative and Free-Rein **(12 Marks)**
b. Explain Maslow's theory of motivation with diagram. **(08 Marks)**

Module-3

5 a. Define Entrepreneur. Explain the characteristics of an entrepreneur. **(10 Marks)**
b. List the qualities of an entrepreneur. **(10 Marks)**

OR

6 a. What are the barriers of entrepreneurship? **(10 Marks)**
b. Write about Technical Feasibility and Social Feasibility study. **(10 Marks)**

Module-4

7 a. Define the project. Give the classification of project. **(10 Marks)**
b. List various factors influencing the selection of project. **(10 Marks)**

OR

8 a. Define ERP. List the importance of ERP. **(10 Marks)**
b. List the contents of project report. **(10 Marks)**

Module-5

9 a. List the category and objectives of MSME. **(10 Marks)**
b. Discuss the Case studies :
i) Shri N.R Naryan Murthy and Infosys **(05 Marks)**
ii) Captain G.R Gopinath. **(05 Marks)**

OR

10 a. List the importance of IPR. **(10 Marks)**
b. Explain: i) TECKSOK ii) KSFC. **(10 Marks)**

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17CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Computer Networks

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Many networks, including internet, provide more than one transport layer protocol. When you develop an application you need to choose one of the available transport layer protocol and consider various parameters. Explain the parameters and protocols to be considered while designing an application. **(08 Marks)**

b. True or False :
i) Processes on two different systems communicate with each other by exchanging messages across the computer networks
ii) A client server architecture achieves perfect security
iii) Socket is a hardware interface through which a process sends message into, and receives messages from the network
iv) No data loss is tolerated in multimedia applications such as conversational audio/video
v) Developing a new network application for the internet often requires one to decide whether to choose UDP or TCP. **(05 Marks)**

c. With a simple sketch, explain how SMTP operate when A send mail to B where mail server of A and B are different. Show the sequence of events. **(07 Marks)**

OR

2 a. HTTPRequest message
GET/somedir/page.html HTTP/1.1
HOST : www.someschool.edu
Connection : close
User_agent : Mozilla/5.0
Accept_language : fr
Interpret the meaning of each line in few sentences. **(05 Marks)**

b. Explain meaning of each line of
HTTPResponse message given below :
HTTP/1.1 200 ok
Connection : close
Date : Tue, 09 Aug 2011 15 : 44 : 04 GMT
Server : Apache/2.2.3
Last modified : Tue, 09 Aug 2011 15 : 11 : 03 GMT
Content_Length : 6821
Content_type : text/html
(data data - - - - -). **(07 Marks)**

c. What is the service provided by DNS system? Explain the meaning of root DNS server, Top Level Domain Servers (TLD), Authoritative DNS servers. Explain the meaning of the following DNS records
(relay1.bar.foo.com, 145.37.93.126, A)
(foo.com, mail.bar.foo.com, MX). **(08 Marks)**

Module-2

3 a. State the assumptions in rdt 2.0 and explain the behavior of the stop-and-wait protocol. Draw the FSM of sender and receiver clearly showing the events and action. **(10 Marks)**

b. Show the operation of GBN protocol of with a sketch. Window size is 4 packets. Show the sequence of sending six packets (pkt0-pkt5) where pkt0 and pkt1 are correctly received and packet (pkt2) 2 is lost. **(10 Marks)**

OR

4 a. With a diagram, explain the TCP segment structure write one line about each field. **(07 Marks)**

b. Explain TCP connection management with appropriate sketches (three way handshake, closing). Explain use of SYN, FIN, RST. **(07 Marks)**

c. Explain the flow control service provided by TCP with a simple sketches show the buffer variation and derive the formula for rwnd. Explain how the window information at receiver side is communicated to the sender. **(06 Marks)**

Module-3

5 a. Explain router architecture with a simple sketch. How packet queueing occur at router? **(08 Marks)**

b. Compare the routing protocols RIP and OSPF. **(04 Marks)**

c. With a diagram, explain each field in the IPV_4 datagram. Write only few sentences about each field. **(08 Marks)**

OR

6 a. Suppose a router receives an IP packet containing 4020 bytes and to be forwarded to an outgoing link with MTU(Maximum Transmission Unit) of 1500 bytes. Assume the IP header is 20 bytes. Show the fragments the router creates and specify relevant values for each fragment (ID, offset and flag) and bytes in each. **(08 Marks)**

b. Draw the IPV_6 datagram format. Indicate two key differences between IPV_4 an IPV_6 format. **(04 Marks)**

c. Refer the following network. Find the shortest path from node 'C' to all other nodes using link state algorithm.

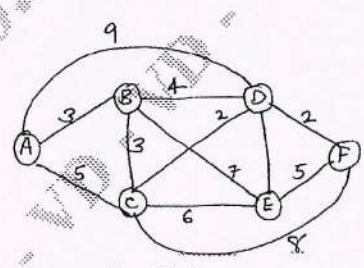

Fig.6(c) **(08 Marks)**

Module-4

7 a. Explain the components in a cellular network. **(10 Marks)**

b. Explain steps of hand off for a mobile users. **(10 Marks)**

OR

8 a. With a diagram explain two different types of routing approach to mobile node. **(10 Marks)**

b. Explain agent discovery in mobile IP. Show the ICMP message and registration steps with home agent. **(10 Marks)**

Module-5

9 a. Explain the working of video streaming over HTTP. Explain perfecting, buffer etc and the roles in this process. **(08 Marks)**

b. Explain how DASH helps to improve streaming over different available bandwidth. **(03 Marks)**

c. Explain CDN operation with a simple sketch in a scenario a user try to get video from a site NetCinema. **(09 Marks)**

OR

10 a. Explain how classes of service (RoS) is achieved in network with a sketch showing two users, one is doing VOIP and the other browsing. Explain packet marking using IPV_4 header. **(10 Marks)**

b. Explain how leaky bucket algorithm is used to achieve traffic policing. **(10 Marks)**

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17CS53

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Database Management System

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Discuss the main characteristics of the database approach and how it differs from traditional file systems? **(08 Marks)**

b. What are the different types of database end users? Discuss the main activities of each. **(06 Marks)**

c. Describe the three schema architecture? **(06 Marks)**

OR

2 a. Design an ER diagram for company database with atleast four entities. **(08 Marks)**

b. What is meant by Recursive relationship type? Give some example of recursive relationship type. **(06 Marks)**

c. What is Generalization? Illustrate how it is helpful with an example. **(06 Marks)**

Module-2

3 a. Discuss the characteristics of relation that make them different from ordinary tables. **(08 Marks)**

b. Discuss DIVISION operation. Find the quotient for the following : A/B_1, A/B_2 and A/B_3; where A, B_1, B_2 and B_3 are

A=

SNo.	PNo.
S_1	P_1
S_1	P_2
S_1	P_3
S_1	P_4
S_2	P_1
S_2	P_2
S_3	P_2
S_4	P_2
S_4	P_4

B_1 =

PNo.
P_2

B_2 =

PNo.
P_2
P_4

B_3 =

PNo.
P_1
P_2
P_4

(08 Marks)

c. Explain the basic datatypes available for attributes in SQL. **(04 Marks)**

OR

4 a. Explain the steps to convert the basic ER model to Relational Database Schema? **(10 Marks)**

b. For the following relations for a book club :
MEMBERS (member-id, Name, Designation, Age)
BOOKS (Bookid, BookTitle, Book-Author, Book-Publisher, Book-price)
RESERVES (Member-id, Book-id, Date)
Write the SQL queries,

(i) Find the names of members who are professors older than 45 years.
(ii) List the titles of books reserved by professors.
(iii) Find ID's of members who have not reserved books that cost more than Rs.500.
(iv) Find the authors and titles of books reserved on 27-May-2017.
(v) Find the names of members who have reserved all books. **(10 Marks)**

Module-3

5 a. What are the components of the JDBC architecture? Describe four different architectural alternatives for JDBC drivers. **(10 Marks)**

b. Why are stored procedures important? How do we declare stored procedure and how they called from application code? **(05 Marks)**

c. Explain the impedance mismatch between host Languages and SQL. **(05 Marks)**

OR

6 a. What is a three tier architecture? What advantages it offer over single tier and two tier architectures? Give a short overview of the functionality at each of the three tiers. **(10 Marks)**

b. What is SQLJ and how it is different from JDBC? **(05 Marks)**

c. What is CGI and what problems does it address? **(05 Marks)**

Module-4

7 a. Explain an Informal design guidelines for a relational schema design. **(08 Marks)**

b. What do you understand by attribute closure? Give an example. **(04 Marks)**

c. Consider the following relations for published books"
Book (Book_title, Author_Name, Book_type, List_Price, Author_Application, Publisher)
Suppose the following dependencies exists
Book_Title → Publisher, Book_Type
Book_Type→ List_price
Author_Name→ Author_Affiliation.
(i) What normal form is the relation in? Explain your answer.
(ii) Apply normalization until you cannot decompose the relations further, state the reasons behind each decomposition. **(08 Marks)**

OR

8 a. A set of functional dependencies for the relation R{A, B, C, D, E, F} is AB→C, C→A, BC→D, ACD→B, BE→C, EC→FA, CF→BD, D→E. Find minimal cover for this set of functional dependencies. **(10 Marks)**

b. Define fourth normal form? When is it violated? Why is it useful? **(06 Marks)**

c. Why is the domain key normal form (DKNF) known as ultimate normal form? **(04 Marks)**

Module-5

9 a. Explain the desirable properties of transaction. **(08 Marks)**

b. Describe the four levels of isolation in SQL. **(06 Marks)**

c. What is the two phase locking protocol? How does it Guarantee serializability? **(06 Marks)**

OR

10 a. What is a time stamp? How does the system generates time stamps? **(06 Marks)**

b. Describe the actions taken by the recovery manager during checkpointing. **(06 Marks)**

c. Explain shadow paging with an example. **(08 Marks)**

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17CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Automata Theory and Computability

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define Language, Grammer and Automata with examples. **(04 Marks)**

b. Define DFSM. Draw a DFSM to accept the Language.

i) $L = \{awa : w \in (a, b)^*\}$. Verify for the string aabaa.

ii) Set of an string having a substring abb over $\sum = \{a, b\}$. Verify for the string aabba. **(08 Marks)**

c. Convert the following NDFSM to its equivalent DFSM (Refer Fig Q1(c))

Fig Q1(c) **(08 Marks)**

OR

2 a. Constant an NDFSM for multiple keywords

$L = \{w \in (a, b)^* : \exists x, y \in \{a, b\}^*$ where

$((w = x\,abbaay) \vee (w = xbabay))\}$ **(04 Marks)**

b. Minimize the following Finite State Machine using partition method. (Refer Fig Q2(b))

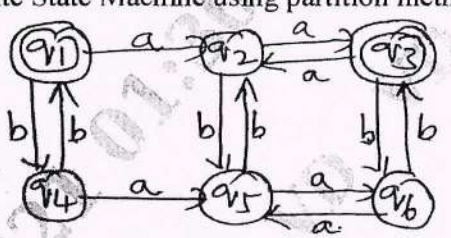

Fig Q2(b) **(08 Marks)**

c. Differentiate between DFSM, NDFSM and $\in$ - NDFSM with examples. **(08 Marks)**

Module-2

3 a. Define Regular expression? Obtain the Regular expression for the following languages.

i) $L = \{a^{2n} b^{2n+1} ; n \geq 0, m \geq 0\}$

ii) $L = \{a^n b^m ; n \geq 4, m \leq 3\}$

iii) Set of string of 0's and 1's whose 10^{th} symbol from the right end side is 1. Justify the answers. **(08 Marks)**

b. State and prove pumping Lemma for regular languages. **(08 Marks)**

c. Define Regular Grammer. Obtain Regular grammer for the language

$L = \{w \in (a, b)^* ;$ w ends with the pattern aaaa$\}$. **(04 Marks)**

OR

4 a. Prove that for every regular defined by regular expression is also defined by Finite State Machine. **(08 Marks)**

b. Prove that the following Language is not regular

$L = \{ww^R ; w \in (0+1)^*$ is not regular$\}$ **(08 Marks)**

c. Construct an NFSM which accepts the regular expression $(a+b)^*abb$. **(04 Marks)**

Module-3

5 a. Define Context Free Grammer. Obtain the Context Free Grammer for the following :
i) $L = \{ww^R : w \in (a, b)^*\}$
ii) Write a CFG to generate balanced parenthesis
Where Bal = $\{w \in \{ \}, \{ \}^*$; parenthesis are balanced$\}$.
Justify the answers. **(08 Marks)**

b. Define Leftmost and rightmost derivations with examples. **(04 Marks)**

c. What is ambiguous grammer? Show that the following grammer is ambiguous for the string id + id * id. $E \rightarrow E + E \mid E - E \mid E * E \mid E / E \mid id$ **(08 Marks)**

OR

6 a. Define PDA, and Instantaneous description of PDA. Obtain a PDA to accept the language. $L = \{wcw^R : w \in (a, b)^*\}$. Draw the transition diagram of PDA, show the moves by this PDA for the string abbcbba. **(10 Marks)**

b. What is CNF and GNF? Convert the grammer in CNF
$S \rightarrow ABa$
$A \rightarrow aab$
$B \rightarrow Ac$ **(05 Marks)**

c. For the following CFG
$S \rightarrow asbb/aab$
Obtain the corresponding PDA. **(05 Marks)**

Module-4

7 a. State the prove Pumping Lemma theorem for Context Free Languages. **(08 Marks)**

b. Show that $L = \{a^n n^n c^n \mid n \geq 0\}$ is not context free. **(08 Marks)**

c. Remove all unit production from the grammer
$S \rightarrow AB$
$A \rightarrow a$
$B \rightarrow C|b$
$C \rightarrow D$
$D \rightarrow E|bc$
$E \rightarrow d|Ab$ **(04 Marks)**

OR

8 a. Explain with neat diagram, the working of a Turing Machine Model. **(06 Marks)**

b. Design a Turing Machine to accept the language $L = \{0^n 1^n 2^n \mid n \geq 1\}$. Draw the transition diagram. Show that moves made by this machine for the string 001122. **(10 Marks)**

c. Briefly explain the techniques for Turing Machine construction. **(04 Marks)**

Module-5

9 a. Design a Turing Machine to accept the language $L = \{0^n 1^n \mid n \geq 1\}$. Draw the transition diagram show the moves made by this machine for the string 000111. **(10 Marks)**

b. Explain the following :
i) Multitape Turing machine
ii) Post correspondence problem. **(10 Marks)**

OR

10 Write short notes on :
a. Non Deterministic Turing Machine
b. Halting Problem of Turing Machine
c. Quantum Computation with example
d. Model of linear bounded automation. **(20 Marks)**

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17CS552

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Introduction to Software Testing

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Discuss the quality attributes in detail, to determine the software quality. **(10 Marks)**
b. Explain in details about how identifying test cases is done in software testing. **(10 Marks)**

OR

2 a. With a neat diagram of a testing life cycle explain following:
i) Fault ii) Failure iii) Incident iv) Test case **(10 Marks)**
b. Explain Testing and Debugging cycle with a diagram. **(10 Marks)**

Module-2

3 a. Explain test case for the triangle problem with respect to decision table based testing with examples. **(12 Marks)**
b. What are Decision Tables? Draw the Decision table for triangle problem. **(08 Marks)**

OR

4 a. List and explain equivalence class testing with diagram write equivalence class test case for triangle problem. **(12 Marks)**
b. With examples explain boundary value analysis with respect to
i) Generalizing boundary value analysis
ii) Limitations of boundary value analysis. **(08 Marks)**

Module-3

5 a. Explain in detail about McCabe's basis path method using graph theory. **(08 Marks)**
b. Explain in detail define/use testing with example. **(12 Marks)**

OR

6 a. Explain about slice based testing in a data flow testing with example. **(10 Marks)**
b. With example explain DD-Paths in path testing. **(10 Marks)**

Module-4

7 a. Explain in detail quality and process in software planning. **(10 Marks)**
b. What is a test oracles? With a neat diagram explain the comparison based test oracles. **(10 Marks)**

OR

8 a. What is Scaffolding? Distinguish between Generic Versus Specific Scaffolding. **(08 Marks)**
b. Explain the basic principles process frame work. **(12 Marks)**

Module-5

9 a. Describe decomposition based integration and its goals. Explain the different types of decomposition based on integration. **(08 Marks)**
b. Explain different types of testing strategies in integration testing. **(12 Marks)**

OR

10 a. Describe basic problem of regression test in integration testing. **(10 Marks)**
b. Explain the following: i) Acceptance testing ii) System testing. **(10 Marks)**

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17CS553

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Advanced Java and J2EE

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Illustrate with an example how enumerations are declared and used in Java programming. Also list out the enumeration restrictions. **(08 Marks)**

b. Describe Auto-boxing and Un-boxing and how it is different from boxing and unboxing. Illustrate with an example. **(06 Marks)**

c. Justify, Java enumerations is a class type with an example. **(06 Marks)**

OR

2 a. With a syntax and example, explain how annotations are created and obtained at runtime. **(07 Marks)**

b. Discuss how reflections can be used at run time with annotations. **(06 Marks)**

c. What do you mean by Type wrapper and explain numeric type wrapper with an example? **(07 Marks)**

Module-2

3 a. Demonstrate linked lists for collections with example. **(07 Marks)**

b. Explain how collections can be accessed using iterator. **(06 Marks)**

c. Write a program to explain Linked list to store address. **(07 Marks)**

OR

4 a. Explain the following Legacy classes with example :
(i) Hash table (ii) Vector **(08 Marks)**

b. Discuss the following collection integers set and list. **(06 Marks)**

c. What is a Collection Frame work? Explain the methods defined by collection interface. **(06 Marks)**

Module-3

5 a. Explain with syntax and example the different constructors available for creating string. **(08 Marks)**

b. Explain the following methods defined for character extraction with example,
(i) charAt ( ) (ii) getChars ( ) (iii) getBytes ( ) (iv) toCharArray ( ) **(08 Marks)**

c. Write a program to remove duplicate characters from a given string and display the resultant string. **(04 Marks)**

OR

6 a. Explain how to modify a string by using following methods:
(i) substring ( ) (ii) concat ( ) (iii) replace ( ) (iv) trim ( ) **(10 Marks)**

b. Explain the following with syntax and example :
(i) equals ( ) and equalsIgnoreCase ( )
(ii) regionMatches ( )
(iii) startsWith ( ) and endsWith ( )
(iv) equals( ) versus == **(10 Marks)**

Module-4

7 a. Explain how cookies can be handled using servlets. **(07 Marks)**
b. Explain different JSP tags with a program to demonstrate all tags. **(08 Marks)**
c. Explain the life cycle of a servlet. **(05 Marks)**

OR

8 a. Write a Java Servlet program to accept two parameters from webpage, find the sum of them, display the result in webpage. Also give necessary Html script to create webpage. **(10 Marks)**
b. What is the role of Tomcat server? Explain different steps involved in configuring for development of Servlet program execution. **(10 Marks)**

Module-5

9 a. Briefly explain the different types of JDBC drivers. **(10 Marks)**
b. Explain various steps of JDBC process with code Snippets. **(10 Marks)**

OR

10 a. Illustrate with an example how to enable Resultset as scrollable.end describe the significance of scrollable Resultset. **(08 Marks)**
b. Explain the types of exceptions occurred in JDBC with example. **(04 Marks)**
c. Explain (i) PreparedStatement object. (ii) CollableStatement object. **(08 Marks)**

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17CS564

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Dot Net Framework for Application Development

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 general structure of C# program with suitable example. **(06 Marks)**

b. With programming example, explain expression bodied methods and string interpolation in C#. **(08 Marks)**

c. Write a C# program to check whether the number read from the user is a strong number or not. (Hint : A number is called strong number if sum of the factorial of its digits is equal to number itself). **(06 Marks)**

OR

2 a. Explain the concept of named arguments and optional parameters with programming example. **(06 Marks)**

b. Define exception. Explain how exception handling is achieved in C#. **(08 Marks)**

c. Write a C# program to find the roots of a quadratic equation by reading the coefficients from the user. **(06 Marks)**

Module-2

3 a. Explain the concept of Boxing and Unboxing with an example. **(06 Marks)**

b. Define class and structure. Give the difference between structure and class. **(08 Marks)**

c. Illustrate the concept of static data, with C# program that counts the number of objects being created by a class. **(06 Marks)**

OR

4 a. Explain value type and reference type with an example. **(06 Marks)**

b. Explain Anonymous classes, with an example. **(06 Marks)**

c. Define Jagged Array. Explain with program hour jagged arrays are declared, populated and computer the sum of all elements. **(08 Marks)**

Module-3

5 a. Explain the concept of parameter arrays with programming example. **(06 Marks)**

b. What is inheritance? What are the advantages and disadvantages of inheritance? Explain usage of base keyword in inheritance. **(08 Marks)**

c. Explain how method overriding is achieved in C# with programming example. **(06 Marks)**

OR

6 a. Explain with example abstract and sealed keyword with respect to class and methods. **(10 Marks)**

b. Explain the steps taken by the garbage collector to destroy objects. **(05 Marks)**

c. Mention the difference between interface and class. **(05 Marks)**

Module-4

7 a. Define property with its syntax. List and explain with example different types of properties. **(10 Marks)**

b. List and explain different operators used to access and manipulate individual bits in 'int' type. **(05 Marks)**

c. Define generic. Write a C# program for swapping of 2 numbers using generic method. **(05 Marks)**

OR

8 a. Explain the Stack<T> and LinkedList<T> collection class with programming example. **(12 Marks)**

b. Define indexer with its syntax. What are the uses of indexers? Demonstrate with an example. **(08 Marks)**

Module-5

9 a. Define Delegate. Explain how to declare delegate with an example. **(10 Marks)**

b. Define event. Explain how to handle event by using a delegate with an example. **(10 Marks)**

OR

10 a. What is LINQ? Explain LINQ for selecting and ordering of data with an programming example. **(10 Marks)**

b. Explain operator overloading and their constraints. Write the complete C# program that creates a class called 'COMPLEX' which simulates a complex number and overloads the operators '+', '–' and '*' for COMPLEX objects. **(10 Marks)**

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15CS/IS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Define management, Briefly explain the characteristics of management. **(10 Marks)**
b. Explain levels of management with a neat diagram. **(06 Marks)**

OR

2 a. What is planning, explain the importance of planning. **(08 Marks)**
b. Explain steps involved in planning. **(08 Marks)**

Module-2

3 a. Discuss the process of selection and recruitment. **(10 Marks)**
b. Based on the authority what are the different leadership styles explain. **(06 Marks)**

OR

4 a. Explain different motivational theories. **(10 Marks)**
b. What is communication, explain its importance. **(06 Marks)**

Module-3

5 a. Explain types of entrepreneurship based on innovation and others. **(10 Marks)**
b. Discuss the role of entrepreneurs in economic development of a country. **(06 Marks)**

OR

6 a. What are the steps involved in identification of business opportunities. **(06 Marks)**
b. Write a short notes on : i) Market feasibility study
ii) Technical feasibility study. **(10 Marks)**

Module-4

7 a. Explain significance and contents of project report. **(10 Marks)**
b. Briefly discuss about project identification. **(06 Marks)**

OR

8 a. What is supply management explain with a neat diagram. **(06 Marks)**
b. Explain steps involved in report writing. **(10 Marks)**

Module-5

9 a. Illustrate steps involved in establishing Micro and Small Scale Industries. **(10 Marks)**
b. Explain characteristics of small and micro industries. **(06 Marks)**

OR

10 a. Explain MSME–DI and NSIC. **(10 Marks)**
b. What Intellectual Property Rights explain in detail? **(06 Marks)**

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15CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 the following terms : Reliable Data Transfer , Loss tolerant applications , Bandwidth sensitive applications , Elastic applications. **(08 Marks)**

b. Explain how recursive queries are resolved in Domain Name System. Illustrate DNS record structure and list any two types of records. **(08 Marks)**

OR

2 a. Discuss Socket Communication between two processes that communicate over Internet with a block diagram. **(08 Marks)**

b. Explain (HTTP) Hyper Text Transfer Protocol request – response behavior. **(08 Marks)**

Module-2

3 a. Describe why an application developer might choose to run an application over UDP rather than TCP. **(08 Marks)**

b. Draw finite state machines for both sender side and receiver side of Go – back – N protocol and explain. **(08 Marks)**

OR

4 a. Explain the structure of UDP and illustrate with an example the checksum calculation. **(08 Marks)**

b. Explain TCP connection management with time line diagrams. **(08 Marks)**

Module-3

5 a. Describe a high level view of a generic router architecture. **(08 Marks)**

b. Find the least cost path using Link – State Routing Algorithm in the network given in Fig.Q5(b). Assume node 'u' as the source node. Also state the algorithm. **(08 Marks)**

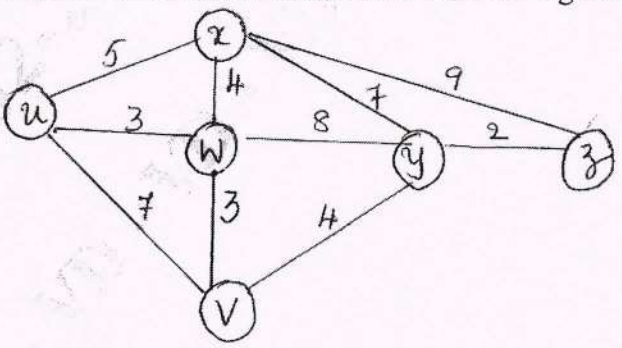

Fig.Q5(b)

OR

6 a. Explain the IPV4 datagram format. **(08 Marks)**

b. Discuss Distance Vector Routing algorithm. Find the least cost by using Distance Vector algorithm with 'u' as the source node in the network given in Fig. Q6(b). Show the routing table for node 'W'. **(08 Marks)**

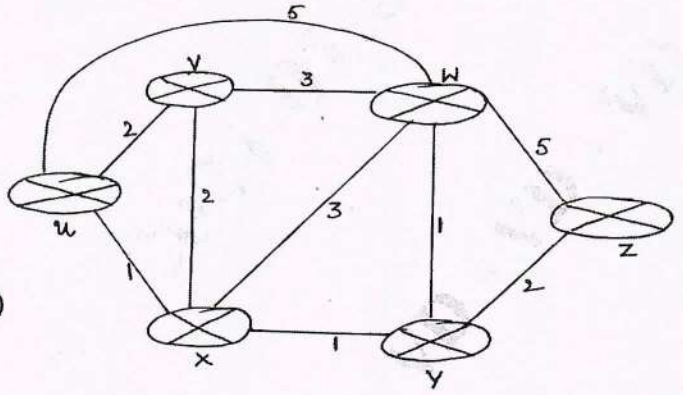

Fig.Q6(b)

Module-4

7 a. Explain 2G Cellular Architecture. **(08 Marks)**

b. What are the initial elements of a Mobile Network Architecture? Bring out the role of Care – of – address, permanent address and foreign address. **(08 Marks)**

OR

8 a. Describe how a call is placed to a mobile GSM user in a visited network. **(08 Marks)**

b. Explain Indirect routing to a mobile node. **(08 Marks)**

Module-5

9 a. Explain the service requirements and design issues in multimedia network applications. **(08 Marks)**

b. Explain Streaming of Stored video over HTTP/TCP. **(08 Marks)**

OR

10 a. What is a Content Distribution Network (CDN)? Explain how DNS is involved in CDN operation. **(08 Marks)**

b. Explain any two scheduling mechanisms as applicable to networks. **(08 Marks)**

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15CS53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 do you mean by Database Management System? Explain the various advantages of using a Database Management System. **(10 Marks)**

b. Describe the three schema architecture with block diagram. Why do we need mappings between schema levels? **(06 Marks)**

OR

2 a. Explain DBMS component modules along with a neat diagram. **(10 Marks)**

b. Define Entity , Entity set, Attribute with respect to ER model. List different types of attributes along with their symbols. **(06 Marks)**

Module-2

3 a. Discuss the Entity integrity and Referential integrity constraints. Why is each considered important? **(06 Marks)**

b. Discuss the following relational algebra operations. Illustrate with an example for each : JOIN , DIFFERENCE , SELECT , UNION. **(10 Marks)**

OR

4 a. Give the E.R to relational mapping algorithm. Discuss each step with an example. **(10 Marks)**

b. Explain the following in SQL :
i) Unspecified WHERE – clause and use of the Asterisk.
ii) Explicit sets and NULLS.
iii) Renaming attributes and joined tables. **(06 Marks)**

Module-3

5 a. Considered the following relations for a database that keeps track of business trips of sales persons in a sale office.
SAILORS (SID, SNAME , RATING , AGE)
BOATS (BID , BNAME, COLOR)
RESERVES (SID , BID , DAY).
Specify the following queries in SQL.
i) Find the names of sailors who have reserved a red or a green boat.
ii) Find the names of sailors who are older than the oldest sailors with a rating of 10.
iii) Find sailors whose rating is better than same sailor called "Ramesh". **(10 Marks)**

b. How does SQL allow implementation of general integrity constraints? **(06 Marks)**

OR

6 a. Describe the concept of a cursor and how it is used in embedded SQL. **(06 Marks)**

b. Explain the term stored procedure and give examples why stored procedures are useful. **(05 Marks)**

c. What are the differences between JDBC and SQLJ? **(05 Marks)**

Module-4

7 a. Explain any two informal quality measures employed for a relational schema design. **(04 Marks)**

b. Explain 1NF , 2NF and 3NF with an example for each. **(12 Marks)**

OR

8 a. Define Multivalued dependency. Explain 4NF, with an example. **(08 Marks)**

b. Define JOIN dependency. Explain 5NF, with an example. **(08 Marks)**

Module-5

9 a. Briefly explain the two phase locking protocol used in concurrency control. **(08 Marks)**

b. What is Schedule? Illustrate with an example. **(05 Marks)**

c. What is Shadow paging scheme? Where it is used? **(03 Marks)**

OR

10 a. Discuss the ACID properties of the database transaction. **(04 Marks)**

b. What is Time stamping? Explain a mechanism of concurrency control that uses time stamping with the help of an example. **(08 Marks)**

c. Write a note on Write ahead log protocol. **(04 Marks)**

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15CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 terms with example:
(i) Length of a string (ii) Reversal (iii) Proper substring
(iv) Language (v) Power of an alphabet **(05 Marks)**

b. Design a FSM to accept set of all strings that either begins or ends or both with substring ab. **(05 Marks)**

c. Convert the given NDFSM to DFSM. (Refer Fig.Q1(c))

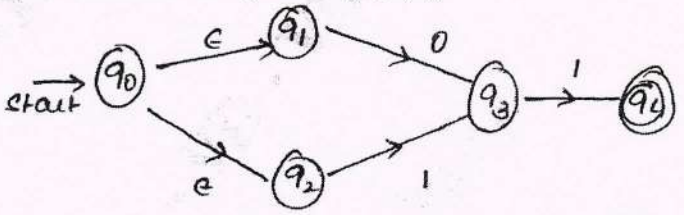

Fig.Q1(c) **(06 Marks)**

OR

2 a. Construct a minimized DFSM for the following: **(08 Marks)**

	↓ A	B	* C	D	E	* F	G	H	* I
0	B	C	D	E	F	G	H	I	A
1	E	F	H	H	I	B	B	C	E

b. Define NDFSM and construct NDFSM for the following languages:
(i) To recognize the following set of strings abc, abd and aacd
(ii) $L = \{w | w \in abab^n \text{ or } aba^n \text{ where } n \geq 0\}$
(iii) $L = \{w | w = aba \text{ or } |w| \text{ is even}\}$ **(08 Marks)**

Module-2

3 a. Define Regular expression. Obtain a regular expression for the following languages:
(i) $L = \{w : |w| \text{ is even}\}$
(ii) $L = \{w : \text{in w the } 5^{th} \text{ character from right is a and either character is b}\}$
(iii) $L = \{w : w \text{ contains both aa and aba as sub string}\}$ **(06 Marks)**

b. Construct FSM for the following RE:
(i) ab (ii) b + (ab) (iii) (b + (ab))* (iv) (babb* + a)* (v) (b + ∈) (ab)* (a + ∈) **(10 Marks)**

OR

4 a. Show that for every RE there is an equivalent FSM. **(05 Marks)**

b. Prove that the regular languages are closed under intersection and difference. **(06 Marks)**

c. Obtain RE from the following FSM. (Refer Fig.Q4(c))

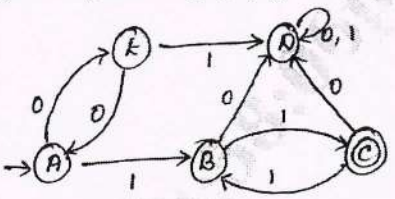

Fig.Q4(c) **(05 Marks)**

Module-3

5 a. Define context free grammar and write CFG for the following languages:
(i) $L = \{a^i b^j c^k : i + j = k, i \geq 0, j \geq 0\}$
(ii) $L = \{a^n b^m c^k : n + 2m = k\}$ **(06 Marks)**

b. Consider the grammar G, with productions:
$S \rightarrow AbB$
$A \rightarrow aA|\in$
$B \rightarrow aB|bB|\in$
Give the left most derivation, rightmost derivation and parse tree for the string aaabab. **(06 Marks)**

c. What is agbigous grammar? Prove that the following grammar is ambiqous on the string aab.
G: $S \rightarrow aS|aSbS|\in$ **(04 Marks)**

OR

6 a. Build a PDA to accept delimiters or balanced paranthesis having paranthesis {, (,) , }. **(08 Marks)**

b. Explain the following terms: (i) Pushdown Automata (PDA) (ii) Languages of a PDA **(04 Marks)**

c. Obtain a CFG for PDA M with the transitions:
$\delta(q_0, a, Z) = (q_0, AZ)$
$\delta(q_0, b, A) = (q_0, AA)$
$\delta(q_0, a, A) = (q_1, \in)$ **(04 Marks)**

Module-4

7 a. State and prove pumping Lemma for context free languages. **(06 Marks)**

b. Prove that $L = \{w \in \{a, b, c\}^* \text{ where } n_a(w) = n_b(w) = n_c(w)\}$ is not context free. **(04 Marks)**

c. Prove that the Context Free Languages are closed under, union and concatenation. **(06 Marks)**

OR

8 a. With a neat diagram, explain the working of a basic TM. **(06 Marks)**

b. Design a TM to accept the following language $L = \{0^n 1^n 2^n \mid n \geq 1\}$ **(10 Marks)**

Module-5

9 Write short notes on:
a. Multi Tape TM
b. Non Deterministic TM
c. Post Correspondence Problem **(16 Marks)**

OR

10 a. Prove that every Language accepted by a multitape TM is accepted by standard TM with single tape. **(06 Marks)**

b. Write note on: (i) Linear Bounded Automata (ii) Recursive Language **(10 Marks)**

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15CS552

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 in detail about Software Quality with respect to Quality Attributes and Reliability. **(08 Marks)**

b. Explain the difference between Requirement Behavior and correctness in Software Testing. **(08 Marks)**

OR

2 a. Explain about Errors and Fault Taxonomies in Software Testing. **(08 Marks)**

b. Explain the levels of abstractions and Testing in Waterfall model in levels of testing. **(08 Marks)**

Module-2

3 a. Explain about the Triangle problems statements with respect to simple version and improved version. Draw the flowchart for the traditional triangle program implementations. **(08 Marks)**

b. Explain about the SATM system and draw the block diagram of SATM terminal and SATM screens. **(08 Marks)**

OR

4 a. Explain the following with test cases for a function of two variables with suitable examples in a Boundary Value Testing.
i) Robustness Testing
ii) Worst Case Testing. **(08 Marks)**

b. Explain the following with test cases in a Decision Table with suitable examples
i) Triangle problem
ii) NextDate functions. **(08 Marks)**

Module-3

5 a. Explain the following :
i) Assumptions in Fault – Based Testing
ii) Mutation Analysis. **(08 Marks)**

b. Explain about Fault Based Adequacy criteria with suitable examples on sample set. **(08 Marks)**

OR

6 a. Explain the following with suitable examples each :
i) Statement Testing
ii) Branch Testing
iii) Condition Testing **(08 Marks)**

b. Explain about McCabe's Basis path method in Basis Path Testing. **(08 Marks)**

Module-4

7 a. Explain the following in details :
   i) Scaffolding
   ii) Test oracles
   iii) Capture and Replay **(08 Marks)**

b. Explain in detail about Dependability properties within a Test and analysis of software process. **(08 Marks)**

OR

8 a. Explain about Risk Management in the Quality plan in a Monitoring the process. **(08 Marks)**

b. Explain the improving the process with respect to :
   i) Structural Testing
   ii) Functional Testing
   iii) System Testing. **(08 Marks)**

Module-5

9 a. Explain about Integration Faults with examples in a Integration and component based Software Testing. **(08 Marks)**

b. Explain about Regression Testing and its selection Techniques. **(08 Marks)**

OR

10 a. Explain the difference between Top Down Integration and Bottom up Integration in a Decomposition Based Integrations. **(08 Marks)**

b. Explain about path Based Integration with respect to New and Extended concepts in a Integration Testing. **(08 Marks)**

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15CS564

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
•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. Explain the general structure of C# program with an example. **(06 Marks)**

b. How can C# compiler implicity infer the type of a variable? Explain with suitable examples. **(06 Marks)**

c. Explain expression bodied methods with a suitable example. **(04 Marks)**

OR

2 a. Consider the following code :

```
public void DoWorkWithData(int intData, float, floatData, int moreData)
 {
      // some codes
}
```

Suppose it has two more implementations as follows:

```
public void DoWorkWithData (int intData)
{
      // some codes
}
```

and

```
public void DoWorkWithData (int moreData)
{
      // some codes
}
```

This code will fail to compile since it fails to invoke correct overloaded version. How can this issue be solved? **(08 Marks)**

b. Explain try, catch, finally and throw keywords with syntax and an example. **(08 Marks)**

Module-2

3 a. How can you state a class, method and data to be static? Give suitable examples. **(09 Marks)**

b. Explain various ways of copying array elements. **(07 Marks)**

OR

4 a. How does C# facilitate in modifying the original argument passed to a method, when the data it references changes within the method? **(08 Marks)**

b. Explain the concept of boxing and unboxing. **(04 Marks)**

c. Differentiate between class and structure. **(04 Marks)**

Module-3

5 a. Write a C# program that has a class TwoDShape with fields dim1 and dim2 and a method area( ). Create a derived class Triangle and Rectangle that inherits TwoDShape. Override method area ( ) to calculate area of Rectangle and Triangle. **(08 Marks)**

b. Write a C# program having a method to calculate the sum of a variable number of int arguments passed to it and returing the result as an int. **(08 Marks)**

OR

6 a. How is multiple inheritance supported in C#? Explain with an example. **(08 Marks)**
b. What is the need for garbage collector? How does it work? **(08 Marks)**

Module-4

7 a. Explain set and get access method with an example. **(08 Marks)**
b. Define indexer with an example. Demonstrate with an example. **(08 Marks)**

OR

8 a. What is the use of generic classes? Write a C# program for swapping :
(i) Two integers (ii) Two characters, using generic method. **(08 Marks)**
b. Explain Stack<T> collection class with an example. **(08 Marks)**

Module-5

9 a. Define delegate. How is it declared? Explain with an example. **(07 Marks)**
b. Write Language Integrated Query(LINQ) to select, filter and order data. **(09 Marks)**

OR

10 a. How does ·NET facilitate to define and trap significant actions and arrange for a delegate to be called? **(08 Marks)**
b. Write a C# program for overloading + operator. **(08 Marks)**

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15CS664

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Explain the computer hardware architecture with a neat sketch. **(06 Marks)**

b. Write a note on general types of errors. **(06 Marks)**

c. Write a program that uses input to prompt a user for their name and then welcomes them. **(04 Marks)**

OR

2 a. Write a program which prompts the user for a Celsius temperature, convert the temperature to Fahrenheit and print the converted temperature. **(06 Marks)**

b. Explain nested conditional statement with an example. **(04 Marks)**

c. Write a program with a function computer grade that takes a score as its parameter and returns a grade as a string. **(06 Marks)**

Module-2

3 a. Analyze the use of break and continue statement with an example. **(06 Marks)**

b. Explain format operators in python with suitable examples. **(03 Marks)**

c. Define a file data structure. Illustrate reading and writing operation on files with examples. **(07 Marks)**

OR

4 a. Write a program to read numbers repeatedly until the user enters 'done'. Once 'done' is entered print out total, count and average of the numbers. **(06 Marks)**

b. Write a note on string methods. **(07 Marks)**

c. Write a program to read through a file and print the contents of the file (line by line) all in upper case. **(03 Marks)**

Module-3

5 a. Explain list operations and list methods with examples. **(05 Marks)**

b. Write a program to count how many times each letter appears in a word. **(07 Marks)**

c. Explain tuple assignment with examples. **(04 Marks)**

OR

6 a. Write a program to open a file and read it line by line. For each line, split the line into list of words using split function. For each word check to see if the word is already in a list. If the word is not in the list, add it to the list. **(06 Marks)**

b. Explain advanced text parsing using dictionary. **(07 Marks)**

c. Why search and find all functions of regular expressions used? Explain with suitable examples. **(03 Marks)**

Module-4

7 a. Define class. Explain classes and objects of python in detail with suitable examples. **(10 Marks)**

b. What is a pure function? Explain with an example. **(06 Marks)**

OR

8 a. Write a program with a function print_time that takes a time object and prints it in the form hour:minute:second. Write another function is_after that takes two time objects t_1 and t_2 and resume True if t_1 follows t_2 chronologically and False otherwise. **(08 Marks)**

b. Write a note on operator overloading with an example. **(08 Marks)**

Module-5

9 a. How to retrieve web pages using urllib? Explain how to compute frequency of each word in the file retrieved. **(08 Marks)**

b. What is an API? Explain with a neat sketch. **(08 Marks)**

OR

10 a. Write a program to read binary files. **(08 Marks)**

b. Explain keys in a database model. **(08 Marks)**

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18CS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship for IT Industry

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 management? List the functional areas of management and explain any two in detail. **(10 Marks)**

b. Explain the managerial skills and the skill-mix required at various levels of management. **(06 Marks)**

c. Write a note on need and importance of staffing. **(04 Marks)**

OR

2 a. Discuss the importance of planning. Briefly explain the general steps involved in planning. **(10 Marks)**

b. Briefly explain the different approaches of management. **(06 Marks)**

c. Define recruitment. List sources of recruitment. **(04 Marks)**

Module-2

3 a. What is motivation? Explain Maslow's need hierarchy theory of motivation. **(10 Marks)**

b. Explain major approaches of leadership. **(06 Marks)**

c. Differentiate between co-ordination and co-operation. **(04 Marks**

OR

4 a. Define control. Briefly explain the methods of establishing control. **(08 Marks)**

b. Explain Herzberg's motivation – hygiene theory. **(08 Marks)**

c. Write a note no importance of communication. **(04 Marks)**

Module-3

5 a. Define entrepreneur. Explain the functions of entrepreneur. **(08 Marks)**

b. What are the barriers of an entrepreneur? **(06 Marks)**

c. Write a note on market and financial feasibility study. **(06 Marks)**

OR

6 a. Explain different type of entrepreneur. **(08 Marks)**

b. Discuss the growth of industrial entrepreneurship in India. **(06 Marks)**

c. Write a note on technical and social feasibility study. **(06 Marks)**

Module-4

7 a. What is a project? Explain in detail the various ways of project identification. **(08 Marks)**

b. Explain the significance of project report. List down the guidelines by planning commission. **(06 Marks)**

c. Write a note on functional areas of management–finance and accounting and human resources. **(06 Marks)**

OR

8 a. What is ERP? Explain the importance and need of a ERP for an organization. (08 Marks)
b. Explain the factors involved in selection of a project. (06 Marks)
c. Write a note on functional areas of management – marketing/sales and supply chain management. (06 Marks)

Module-5

9 a. Explain the steps involved in establishing micro and small enterprises. (10 Marks)
b. Discuss the case study of air Deccan (Captain G.R Gopinath). (06 Marks)
c. What is patent? List different types of patents. (04 Marks)

OR

10 a. Explain the following institutions :
i) KIADB
ii) KSSIDC
iii) NSIC
iv) KSFC
v) DIC. (10 Marks)
b. Discuss the case study of Infosgs (N.R. Narayana Murthy). (06 Marks)
c. List the advantages of micro and small enterprises. (04 Marks)

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18CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Computer Networks and Security

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 the different transport services available to applications? Explain. **(07 Marks)**

b. Explain HTTP request and response message format. **(08 Marks)**

c. Write a note on FTP and discuss about FTP command and replies. **(05 Marks)**

OR

2 a. What are the steps involved between client and server in order to fetch 10 JPEG images, which are residing in the same server by using non-persistent HTTP connection. The URL for base HTML file is http : //www.xyz.edu/department/base.index. **(07 Marks)**

b. With a neat diagram and explain, explain how DNS server will interact to various DNS server hierarchically. **(05 Marks)**

c. Illustrate how user1 can send mail to user2, and how user2 receives the mail by using SMTP. **(08 Marks)**

Module-2

3 a. How multiplexing and demultiplexing for a connectionless oriented will be performed at transport layer? **(06 Marks)**

b. Describe the various fields of UDP segment and also explain about UDP checksum with an example. **(07 Marks)**

c. Explain how TCP provides a flow control service by using different variables. **(07 Marks)**

OR

4 a. Explain the operation of selective repeat protocol. **(06 Marks)**

b. Explain all the fields in a TCP segment. **(07 Marks)**

c. How TCP connection management is done for three way handshake by the client and server for establishing and closing a connection. Explain. **(07 Marks)**

Module-3

5 a. Explain distance vector algorithm with an example. **(08 Marks)**

b. Explain the three switching techniques in a router. **(06 Marks)**

c. Draw IPV_6 datagram format, mention the significance of each fields. **(06 Marks**

OR

6 a. Explain link state algorithm with an example. **(08 Marks)**

b. Describe the intra-AS routing protocol : RIP in detail. **(06 Marks)**

c. Discuss about uncontrolled flooding and controlled flooding in broadcast routing algorithm. **(06 Marks)**

Module-4

7 a. Classify the different network attacks and explain denial of service attack. **(07 Marks)**

b. What are the two different techniques used to protect network from attacks? Explain. **(07 Marks)**

c. Write the steps involved in Data Encryption Standard (DES) along with a diagram. **(06 Marks)**

OR

8 a. Explain key generation, encryption and decryption phases in RSA algorithm. Illustrate with an example. **(07 Marks)**

b. Explain the technique involved in Hash function for authentication along with a diagram. **(07 Marks)**

c. Discuss about packet filtering and proxy server with respect to firewalls. **(06 Marks)**

Module-5

9 a. What are the classification in multimedia network applications? Explain. **(08 Marks)**

b. What are the two types of loss anticipation schemes? Explain. **(07 Marks)**

c. What do you mean by a Jitter and how to remove the Jitter at the receiver for audio by fixed and adaptive play out delay? **(05 Marks)**

OR

10 a. Explain the working of CDN. **(08 Marks)**

b. Explain about HTTP streaming in case of streaming stored video. **(07 Marks)**

c. Discuss about the properties of audio and video in multimedia networking. **(05 Marks)**

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18CS53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Database Management System

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define the following terms :
i) Database
ii) DBMS catalog
iii) Entity
iv) Snapshot
v) Degree of a relationship. **(05 Marks)**

b. Explain types of end-users with suitable examples. **(05 Marks)**

c. List and explain advantages of using DBMS approach. **(10 Marks**

OR

2 a. Define the following terms
i) Cardinality
ii) Weak entity
iii) Program data independence
iv) Total participation
v) Value sets. **(05 Marks)**

b. Describe three schema architecture. Why do we need mappings between schema levels? **(05 Marks)**

c. Explain different types of attributes in ER model with suitable examples for each. **(10 Marks**

Module-2

3 a. Explain the entity integrity and referential integrity constraints. Why is each considered important. Give examples. **(05 Marks)**

b. Discuss equijoin and natural join with suitable examples using relational algebra notation. **(05 Marks)**

c. Given the schema :
Passenger (pid, pname, pgender, pcity)
Agency (aid, anme, acity)
Flight (fid, fdate, time, src, dest)
Booking (pid, aid, fid, fdate)
Give relation algebra expression for the following :
i) Get the complete details of all flights to new Delhi
ii) Find only the flight numbers for passenger with paid 123 for flights to Chennai before 06/11/2020
iii) Find the passenger names for those who do not have any bookings in any flights
iv) Get the details of flights that are scheduled on both dates 01/12/2020 and 02/12/2020 at 16:00 hours
v) Find the details of all male passengers who are associated with jet agency. **(10 Marks)**

OR

4 a. Explain the ER to relational mapping algorithm with suitable example for each step. **(10 Marks)**

b. Write SQL query for the following database scheme :
Employee(employee_name, street, city)
Works (employee_name, company_name, salary)
Company(company_name, city)
Manages(employee_name, manager_name)

i) Find the names, street address, and cities of residence for all employees who work for `First Bank Corporation` and earn more than $10,000

ii) Find the names of all employees in the database who do not work for `First Bank Corporation`. Assume that all people work for exactly one company

iii) Find the names of all employees in the database who earn more that every employee of `Small Bank Corporation`. Assume that all people work for at most one company

iv) Find the name of the company that has the smallest payroll

v) Find the names of all employees in the database who live in the same cities and on the same streets as do their managers. **(10 Marks)**

Module-3

5 a. Explain cursors and its properties in embedded SQL with suitable example. **(05 Marks)**

b. How are triggers defined in SQL? Explain with example. **(05 Marks)**

c. Illustrate insert, delete, update, alter and drop statements in SQL. **(10 Marks)**

OR

6 a. With an example, explain stored procedures In SQL. **(05 Marks)**

b. Briefly explain types of JDBC drives. **(05 Marks)**

c. Illustrate aggregate functions in SQL. **(10 Marks)**

Module-4

7 a. Explain types of update ananalies with examples. **(05 Marks)**

b. Explain Armstrong inference rules. **(05 Marks)**

c. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples. **(10 Marks**

OR

8 a. What is functional dependency? Write an algorithm to find minimal cover for set of functional dependencies. Construct minimal cover m for set of functional dependencies which are : $E : \{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$ **(10 Marks)**

b. Consider the schema R = ABCD, subjected to FDs $F = \{A \rightarrow B, B \rightarrow C\}$, and the non-binary partition D1 = {ACD, AB, BC}. State whether D1 is a lossless decomposition? [give all steps in detail]. **(10 Marks)**

Module-5

9 a. Define transaction. Discuss ACID properties. **(05 Marks)**

b. With a neat diagram explain transition diagram of a transaction. **(05 Marks)**

c. Why concurrency control and recovery are needed in DBMS? Explain types of problems that may occur when two simple transactions run concurrently. **(10 Marks)**

OR

10 a. When deadlock and starvation problem occur? Explain how these problems can be resolved. **(10 Marks)**

b. Briefly discuss the two-phase locking techniques for concurrency control. **(10 Marks)**

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18CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Automata Theory and Computability

Time: 3 hrs. Max. Marks: 100

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) Symbol **(04 Marks)**

b. Design a DFSM to accept each of the following language:
i) $L = \{w \in \{a, b\}^* ; w$ has all strings that ends with sub string abb $\}$
ii) $L = \{w;$ where $|w| \bmod 3 = 0$ where $\Sigma = \{a\}\}$
iii) $L = \{w \in \{a, b\}^*$ every a region in w is of even length.$\}$ **(09 Marks)**

c. Construct an equivalent DFA from the following given NFA using subset construction method. (Refer Fig.Q.1(c)) **(07 Marks)**

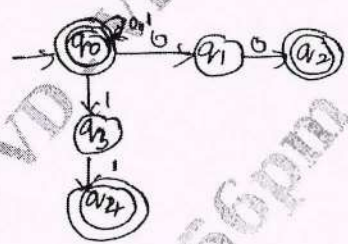

Fig.Q.1(c)

OR

2 a. Construct a minimum state automation equivalent to the FA given table

States	0	1
$\rightarrow q_0$	q_1	q_5
q_1	q_6	q_2
(q_2)	q_0	q_2
q_3	q_2	q_6
q_4	q_7	q_5
q_5	q_2	q_6
q_6	q_6	q_4
q_7	q_6	q_2

(10 Marks)

b. Consider the following NFA with ϵ-moves construct on equivalent DFA. **(10 Marks)**

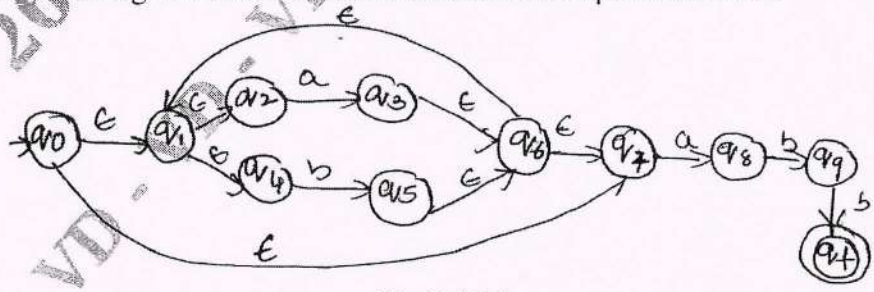

Fig.Q.2(b)

Module-2

3 a. Define Regular expression. Write RE for the following languages:

i) $L = \{a^n b^m \mid m+n \text{ is even}\}$

ii) $L = \{a^n b^m \mid m \geq 1 \;\; n \geq 1 \;\; nm \geq 3\}$

iii) $L = \{a^{2n} b^{2m} \mid n \geq 0, m \geq 0\}$ **(10 Marks)**

b. Construct an $\in$ - NFA for the regular expression $0 + 01^*$ **(05 Marks)**

c. Construct on FA for the regular expression $10 + (0 + 11)0^*1$ **(05 Marks)**

OR

4 a. State and prove pumping lemma theorem for regular languages. **(08 Marks)**

b. Prove that $L = \{a^p \mid p \text{ is a prime}\}$ is not a regular. **(08 Marks)**

c. List out closure properties of regular sets. **(04 Marks)**

Module-3

5 a. Define CFG. Write a CFG to specify

i) all string over {a, b} that are even and odd palindromes.

ii) $L = \{a^n b^{2n} \text{ over } \Sigma = \{a, b\} n \geq 1\}$ **(10 Marks)**

b. Write the procedure for removal of $\in$-productions. Simplify the following grammar.

$S \rightarrow aA \mid aBB$

$A \rightarrow aAA \mid \in$

$B \rightarrow bB \mid bbC$

$C \rightarrow B$ **(10 Marks)**

OR

6 a. Define PDA. Design a PDA for the language that accepts the string with $n_a(w) < n_b(w)$ where $w \in (a + b)^*$ and show the instantaneous description of the PDA on input abbab. **(10 Marks)**

b. What is CNF and GNF? Convert the following grammar into GNF.

$S \rightarrow AA \mid a$

$A \rightarrow SS \mid b$ **(10 Marks)**

Module-4

7 a. With a neat diagram, explain variant of turning machine. **(10 Marks)**

b. Construct a Turning machine that accept the language $0^n, 1^n$ where $n > 1$ and draw transition graph for Turning Machine. **(10 Marks)**

OR

8 a. Define Turning Machine with its tuples. **(04 Marks)**

b. Explain the working principle of Turning Machine with diagram. Design a Turing Machine to accept strings formed on {0, 1} and ending with 000. Write transition diagram and ID for w = 101000. **(16 Marks)**

Module-5

9 a. Explain restricted turing machines. **(08 Marks)**

b. Explain the following with example:

i) Decidability ii) Decidable languages iii) Undecidable languages. **(12 Marks)**

OR

10 Write a short note on:

a. Post correspondence problem

b. Halting problems in Turning Machine

c. Linear Bound Automation (LBA)

d. Classes of P and NP **(20 Marks)**

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18CS55

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Application Development using Python

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Demonstrate with example print( ), input( ) and string replication. **(06 Marks)**

b. Explain elif, for, while, break and continue statements in python with examples for each. **(10 Marks)**

c. Write a Python program to check whether a given number is even or odd. **(04 Marks)**

OR

2 a. How can we pass parameters in user defined functions? Explain with suitable example. **(05 Marks)**

b. Explain local and global scope with local and global variables. **(08 Marks)**

c. Demonstrate the concept of exception. Implement a code which prompts the user for Celsius temperature, convert the temperature to Fahrenheit, and print out the converted temperature by handling the exception. **(07 Marks)**

Module-2

3 a. What is list? Explain append( ), insert( ) and remove( ) methods with examples. **(08 Marks)**

b. How is tuple different from a list and which function is used to convert list to tuple. **(05 Marks)**

c. Create a function to print out a blank tic – tac – toe board. **(07 Marks)**

OR

4 a. Discuss get( ), item( ), keys( ) and values( ) Dictionary methods in python with examples. **(08 Marks)**

b. With example code explain join( ) and split( ) string methods. **(06 Marks)**

c. Develop a program to accept a sentence form the user and display the longest word of that sentence along with its length. **(06 Marks**

Module-3

5 a. What are regular expression? Describe question mark, star, plus-and dot Regex symbols with suitable python code snippet. **(09 Marks)**

b. With code snippet, explain saving variables using the shelve module and PPrint Pformat( ) functions. **(06 Marks)**

c. Write a program that reads a string with five characters which starts with 'a' and ends with 'z'. Print search successful if pattern matches string. **(05 Marks)**

OR

6 a. Explain functions of Shutil Module with examples. **(08 Marks)**

b. Explain buttons in the Debug control widow. **(05 Marks)**

c. What is meant by compressing files? Explain reading, extracting and creating ZIP files with code snippet. **(07 Marks)**

Module-4

7 a. What is class, object, attributes. Explain copy·copy( ) with an example. **(06 Marks)**
b. Demonstrate pure functions and modifiers with examples. **(08 Marks)**
c. Use the datetime module to write a program that gets the current date and prints that day of the week. **(06 Marks)**

OR

8 a. Explain operator overloading and polymorphism with examples. **(08 Marks)**
b. Illustrate the concepts of inheritance and class diagrams with examples. **(08 Marks)**
c. Write a function called print time that takes a time object and print it in the form hour : minute : second. **(04 Marks)**

Module-5

9 a. Explain parsing HTML with the BeautifulSoup Module with code snippet for creating finding an element and getting data. **(09 Marks)**
b. What methods do Selenium's web element object have for simulating mouse clicks and keyboard keys. Explain with python code snippet. **(06 Marks)**
c. Write a python program to access cell in a worksheet. **(05 Marks)**

OR

10 a. Write a program to get a list of all files with the pdf extension in the current working director and sort them. **(06 Marks)**
b. Demonstrate the json module with python program. **(06 Marks)**
c. What are the advantages of CSV files? Explain the Reader objects and Writer objects with python code. **(08 Marks)**

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18CS56

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
UNIX Programming

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 a architecture of UNIX operating system. **(10 Marks)**

b. List and explain the silent features of UNIX operating system. **(10 Marks)**

OR

2 a. What is a parent child relationship? With the help of neat diagram, explain UNIX file system. **(06 Marks)**

b. Explain any five file related commands with an example. **(10 Marks)**

c. With suitable example, bring out the differences between absolute and relative pathnames. **(04 Marks)**

Module-2

3 a. Which command is used for listing of file attributes? Explain the significance of each field. **(08 Marks)**

b. File current permissions are rw_r_xr_ _ specify chmod expression required to change for the following using both relative and absolute methods:
(i) rwxrwxrwx (ii) r_ _r_ _ _ _ _ (iii) _ _ _ _ _ _ _ _ _
(iv) _ _ _ r _ _ r _ _ (v) _ _ _ _ _ x _ w _ **(10 Marks)**

c. What is a shell? Briefly give the shell interpretive cycle. **(02 Marks)**

OR

4 a. With the help of an example, explain grep command with all the options. **(10 Marks)**

b. Explain three standard files supported by UNIX. **(06 Marks)**

c. What is the output for the following:
(i) ls [ijk]*doc (ii) [A – Z] ????* (iii) *·[!s][!h] (iv) *[!0 – 9] **(04 Marks)**

Module-3

5 a. Describe general UNIX file API's with syntax and explain each field in detail. **(10 Marks)**

b. Explain with a neat diagram memory layout of a C program and briefly discuss the different functions used for memory allocation. **(10 Marks)**

OR

6 a. Explain the UNIX Kernal support for process considering parent – child process show the related data structures. **(10 Marks)**

b. Bring out the differences between fork and vfork functions. **(05 Marks)**

c. Explain getrlimit and setrlimit function with prototype. **(05 Marks)**

Module-4

7 a. Explain setuid and setgid functions with example and explain various ways to change user ids. **(06 Marks)**

b. What are pipes? What are its limitations? Write a program to send data from parent to child over a pipe. **(08 Marks)**

c. What are Interpreter Files? Give the difference between interpreter files and interpreter. **(06 Marks)**

OR

8 a. What is a FIFO? With a neat diagram, explain client server communication using FIFO. **(08 Marks)**

b. What are stream pipe? What are the different ways to view stream pipes? **(04 Marks)**

c. Explain briefly with example: (i) message queue (ii) semaphores **(08 Marks)**

Module-5

9 a. What are signals? Mention different source of signals? Write a program to setup signal handlers for SIGINIT and SIGALRM. **(10 Marks)**

b. What are Daemon process? Enlist their characteristics. Also write a program to transform a normal user process into a Daemon process. **(10 Marks)**

OR

10 a. Explain the kill( ) API and alaram( ) API. **(10 Marks)**

b. Explain the Sigsetjmp and Siglongjmp functions with an example. **(10 Marks)**

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17CS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship for IT Industry

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. List and explain the functions of management. **(10 Marks)**
b. List and principles of management given by Henri Fayol. **(10 Marks)**

OR

2 a. Define and list the purpose of planning. **(10 Marks)**
b. List the principle of organization. **(10 Marks)**

Module-2

3 a. What is recruitment? Explain various sources of recruitment. **(10 Marks)**
b. Define Direction. List the principle of direction. **(10 Marks)**

OR

4 a. List the difference between Autocratic, Participative and Free-Rein **(12 Marks)**
b. Explain Maslow's theory of motivation with diagram. **(08 Marks)**

Module-3

5 a. Define Entrepreneur. Explain the characteristics of an entrepreneur. **(10 Marks)**
b. List the qualities of an entrepreneur. **(10 Marks)**

OR

6 a. What are the barriers of entrepreneurship? **(10 Marks)**
b. Write about Technical Feasibility and Social Feasibility study. **(10 Marks)**

Module-4

7 a. Define the project. Give the classification of project. **(10 Marks)**
b. List various factors influencing the selection of project. **(10 Marks)**

OR

8 a. Define ERP. List the importance of ERP. **(10 Marks)**
b. List the contents of project report. **(10 Marks)**

Module-5

9 a. List the category and objectives of MSME. **(10 Marks)**
b. Discuss the Case studies :
i) Shri N.R Naryan Murthy and Infosys **(05 Marks)**
ii) Captain G.R Gopinath. **(05 Marks)**

OR

10 a. List the importance of IPR. **(10 Marks)**
b. Explain: i) TECKSOK ii) KSFC. **(10 Marks)**

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17CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Computer Networks

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Many networks, including internet, provide more than one transport layer protocol. When you develop an application you need to choose one of the available transport layer protocol and consider various parameters. Explain the parameters and protocols to be considered while designing an application. **(08 Marks)**

b. True or False :
i) Processes on two different systems communicate with each other by exchanging messages across the computer networks
ii) A client servser architecture achieves perfect security
iii) Socket is a hardware interface through which a process sends message into, and receives messages from the network
iv) No data loss is tolerated in multimedia applications such as conversational audio/video
v) Developing a new network application for the internet offen requires one to decide whether to choose UDP or TCP. **(05 Marks)**

c. With a simple sketch, explain how SMTP operate when A send mail to B where mail server of A and B are different. Show the sequence of events. **(07 Marks)**

OR

2 a. HTTPRequest message
GET/somedir/page.html HTTP/1.1
HOST : www.someschool.edu
Connection : close
User_agent : Mozilla/5.0
Accept_language : fr
Interpret the meaning of each line in few sentences. **(05 Marks)**

b. Explain meaning of each line of
HTTPResponse message given below :
HTTP/1.1 200 ok
Connection : close
Date : Tue, 09 Aug 2011 15 : 44 : 04 GMT
Server : Apache/2.2.3
Last modified : Tue, 09 Aug 2011 15 : 11 : 03 GMT
Content_Length : 6821
Content_type : text/html
(data data - - - - -). **(07 Marks)**

c. What is the service provided by DNS system? Explain the meaning of root DNS server, Top Level Domain Servers (TLD), Authoritative DNS servers. Explain the meaning of the following DNS records
(relay1.bar.foo.com, 145.37.93.126, A)
(foo.com, mail.bar.foo.com, MX). **(08 Marks)**

Module-2

3 a. State the assumptions in rdt 2.0 and explain the behavior of the stop-and-wait protocol. Draw the FSM of sender and receiver clearly showing the events and action. **(10 Marks)**

b. Show the operation of GBN protocol of with a sketch. Window size is 4 packets. Show the sequence of sending six packets (pkt0-pkt5) where pkt0 and pkt1 are correctly received and packet (pkt2) 2 is lost. **(10 Marks)**

OR

4 a. With a diagram, explain the TCP segment structure write one line about each field. **(07 Marks)**

b. Explain TCP connection management with appropriate sketches (three way handshake, closing). Explain use of SYN, FIN, RST. **(07 Marks)**

c. Explain the flow control service provided by TCP with a simple sketches show the buffer variation and derive the formula for rwnd. Explain how the window information at receiver side is communicated to the sender. **(06 Marks)**

Module-3

5 a. Explain router architecture with a simple sketch. How packet queueing occur at router? **(08 Marks)**

b. Compare the routing protocols RIP and OSPF. **(04 Marks)**

c. With a diagram, explain each field in the IPV_4 datagram. Write only few sentences about each field. **(08 Marks)**

OR

6 a. Suppose a router receives an IP packet containing 4020 bytes and to be forwarded to an outgoing link with MTU(Maximum Transmission Unit) of 1500 bytes. Assume the IP header is 20 bytes. Show the fragments the router creates and specify relevant values for each fragment (ID, offset and flag) and bytes in each. **(08 Marks)**

b. Draw the IPV_6 datagram format. Indicate two key differences between IPV_4 an IPV_6 format. **(04 Marks)**

c. Refer the following network. Find the shortest path from node 'C' to all other nodes using link state algorithm.

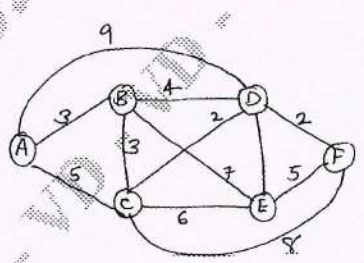

Fig.6(c) **(08 Marks)**

Module-4

7 a. Explain the components in a cellular network. **(10 Marks)**

b. Explain steps of hand off for a mobile users. **(10 Marks)**

OR

8 a. With a diagram explain two different types of routing approach to mobile node. **(10 Marks)**

b. Explain agent discovery in mobile IP. Show the ICMP message and registration steps with home agent. **(10 Marks)**

Module-5

9 a. Explain the working of video streaming over HTTP. Explain perfecting, buffer etc and the roles in this process. **(08 Marks)**

b. Explain how DASH helps to improve streaming over different available bandwidth. **(03 Marks)**

c. Explain CDN operation with a simple sketch in a scenario a user try to get video from a site NetCinema. **(09 Marks)**

OR

10 a. Explain how classes of service (RoS) is achieved in network with a sketch showing two users, one is doing VOIP and the other browsing. Explain packet marking using IPV_4 header. **(10 Marks)**

b. Explain how leaky bucket algorithm is used to achieve traffic policing. **(10 Marks)**

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17CS53

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Database Management System

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Discuss the main characteristics of the database approach and how it differs from traditional file systems? **(08 Marks)**

b. What are the different types of database end users? Discuss the main activities of each. **(06 Marks)**

c. Describe the three schema architecture? **(06 Marks)**

OR

2 a. Design an ER diagram for company database with atleast four entities. **(08 Marks)**

b. What is meant by Recursive relationship type? Give some example of recursive relationship type. **(06 Marks)**

c. What is Generalization? Illustrate how it is helpful with an example. **(06 Marks)**

Module-2

3 a. Discuss the characteristics of relation that make them different from ordinary tables. **(08 Marks)**

b. Discuss DIVISION operation. Find the quotient for the following : A/B_1, A/B_2 and A/B_3; where A, B_1, B_2 and B_3 are

A=

SNo.	PNo.
S_1	P_1
S_1	P_2
S_1	P_3
S_1	P_4
S_2	P_1
S_2	P_2
S_3	P_2
S_4	P_2
S_4	P_4

B_1 =

PNo.
P_2

B_2 =

PNo.
P_2
P_4

B_3 =

PNo.
P_1
P_2
P_4

(08 Marks)

c. Explain the basic datatypes available for attributes in SQL. **(04 Marks)**

OR

4 a. Explain the steps to convert the basic ER model to Relational Database Schema? **(10 Marks)**

b. For the following relations for a book club :
MEMBERS (member-id, Name, Designation, Age)
BOOKS (Bookid, BookTitle, Book-Author, Book-Publisher, Book-price)
RESERVES (Member-id, Book-id, Date)
Write the SQL queries,
(i) Find the names of members who are professors older than 45 years.
(ii) List the titles of books reserved by professors.
(iii) Find ID's of members who have not reserved books that cost more than Rs.500.
(iv) Find the authors and titles of books reserved on 27-May-2017.
(v) Find the names of members who have reserved all books. **(10 Marks)**

Module-3

5 a. What are the components of the JDBC architecture? Describe four different architectural alternatives for JDBC drivers. **(10 Marks)**

b. Why are stored procedures important? How do we declare stored procedure and how they called from application code? **(05 Marks)**

c. Explain the impedance mismatch between host Languages and SQL. **(05 Marks)**

OR

6 a. What is a three tier architecture? What advantages it offer over single tier and two tier architectures? Give a short overview of the functionality at each of the three tiers. **(10 Marks)**

b. What is SQLJ and how it is different from JDBC? **(05 Marks)**

c. What is CGI and what problems does it address? **(05 Marks)**

Module-4

7 a. Explain an Informal design guidelines for a relational schema design. **(08 Marks)**

b. What do you understand by attribute closure? Give an example. **(04 Marks)**

c. Consider the following relations for published books"
Book (Book_title, Author_Name, Book_type, List_Price, Author_Application, Publisher)
Suppose the following dependencies exists
Book_Title → Publisher, Book_Type
Book_Type→ List_price
Author_Name→ Author_Affiliation.
(i) What normal form is the relation in? Explain your answer.
(ii) Apply normalization until you cannot decompose the relations further, state the reasons behind each decomposition. **(08 Marks)**

OR

8 a. A set of functional dependencies for the relation R{A, B, C, D, E, F} is AB→C, C→A, BC→D, ACD→B, BE→C, EC→FA, CF→BD, D→E. Find minimal cover for this set of functional dependencies. **(10 Marks)**

b. Define fourth normal form? When is it violated? Why is it useful? **(06 Marks)**

c. Why is the domain key normal form (DKNF) known as ultimate normal form? **(04 Marks)**

Module-5

9 a. Explain the desirable properties of transaction. **(08 Marks)**

b. Describe the four levels of isolation in SQL. **(06 Marks)**

c. What is the two phase locking protocol? How does it Guarantee serializability? **(06 Marks)**

OR

10 a. What is a time stamp? How does the system generates time stamps? **(06 Marks)**

b. Describe the actions taken by the recovery manager during checkpointing. **(06 Marks)**

c. Explain shadow paging with an example. **(08 Marks)**

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17CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Automata Theory and Computability

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define Language, Grammer and Automata with examples. **(04 Marks)**

b. Define DFSM. Draw a DFSM to accept the Language.
   i) $L = \{awa : w \in (a, b)^*\}$. Verify for the string aabaa.
   ii) Set of an string having a substring abb over $\sum = \{a, b\}$. Verify for the string aabba. **(08 Marks)**

c. Convert the following NDFSM to its equivalent DFSM (Refer Fig Q1(c))

Fig Q1(c) **(08 Marks)**

OR

2 a. Constant an NDFSM for multiple keywords
$L = \{w \in (a, b)^* : \exists x, y \in \{a, b\}^*$ where
$((w = x\,abbaay) \vee (w = x\,babay))\}$ **(04 Marks)**

b. Minimize the following Finite State Machine using partition method. (Refer Fig Q2(b))

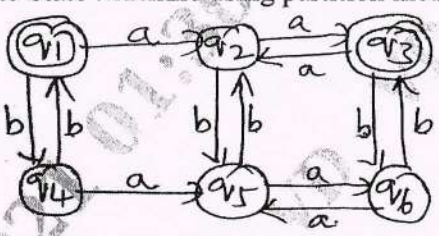

Fig Q2(b) **(08 Marks)**

c. Differentiate between DFSM, NDFSM and $\in$ - NDFSM with examples. **(08 Marks)**

Module-2

3 a. Define Regular expression? Obtain the Regular expression for the following languages.
   i) $L = \{a^{2n} b^{2n+1} ; n \geq 0, m \geq 0\}$
   ii) $L = \{a^n b^m ; n \geq 4, m \leq 3\}$
   iii) Set of string of 0's and 1's whose 10^{th} symbol from the right end side is 1. Justify the answers. **(08 Marks)**

b. State and prove pumping Lemma for regular languages. **(08 Marks)**

c. Define Regular Grammer. Obtain Regular grammer for the language
$L = \{w \in (a, b)^* ;$ w ends with the pattern aaaa$\}$. **(04 Marks)**

OR

4 a. Prove that for every regular defined by regular expression is also defined by Finite State Machine. **(08 Marks)**

b. Prove that the following Language is not regular
$L = \{ww^R ; w \in (0+1)^*$ is not regular$\}$ **(08 Marks)**

c. Construct an NFSM which accepts the regular expression $(a+b)^*abb$. **(04 Marks)**

Module-3

5 a. Define Context Free Grammer. Obtain the Context Free Grammer for the following :
   i) $L = \{ww^R : w \in (a, b)^*\}$
   ii) Write a CFG to generate balanced parenthesis
   Where Bal = {w∈ {), (}* ; parenthesis are balanced}.
   Justify the answers. **(08 Marks)**

b. Define Leftmost and rightmost derivations with examples. **(04 Marks)**

c. What is ambiguous grammer? Show that the following grammer is ambiguous for the string id + id * id. $E \rightarrow E + E \mid E - E \mid E * E \mid E / E \mid id$ **(08 Marks)**

OR

6 a. Define PDA, and Instantaneous description of PDA. Obtain a PDA to accept the language. $L = \{wcw^R : w \in (a, b)^*\}$. Draw the transition diagram of PDA, show the moves by this PDA for the string abbcbba. **(10 Marks)**

b. What is CNF and GNF? Convert the grammer in CNF
   $S \rightarrow ABa$
   $A \rightarrow aab$
   $B \rightarrow Ac$ **(05 Marks)**

c. For the following CFG
   $S \rightarrow asbb/aab$
   Obtain the corresponding PDA. **(05 Marks)**

Module-4

7 a. State the prove Pumping Lemma theorem for Context Free Languages. **(08 Marks)**

b. Show that $L = \{a^n n^n c^n \mid n \geq 0\}$ is not context free. **(08 Marks)**

c. Remove all unit production from the grammer
   $S \rightarrow AB$
   $A \rightarrow a$
   $B \rightarrow C|b$
   $C \rightarrow D$
   $D \rightarrow E|bc$
   $E \rightarrow d|Ab$ **(04 Marks)**

OR

8 a. Explain with neat diagram, the working of a Turing Machine Model. **(06 Marks)**

b. Design a Turing Machine to accept the language $L = \{0^n 1^n 2^n \mid n \geq 1\}$. Draw the transition diagram. Show that moves made by this machine for the string 001122. **(10 Marks)**

c. Briefly explain the techniques for Turing Machine construction. **(04 Marks)**

Module-5

9 a. Design a Turing Machine to accept the language $L = \{0^n 1^n \mid n \geq 1\}$. Draw the transition diagram show the moves made by this machine for the string 000111. **(10 Marks)**

b. Explain the following :
   i) Multitape Turing machine
   ii) Post correspondence problem. **(10 Marks)**

OR

10 Write short notes on :
   a. Non Deterministic Turing Machine
   b. Halting Problem of Turing Machine
   c. Quantum Computation with example
   d. Model of linear bounded automation. **(20 Marks)**

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17CS552

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Introduction to Software Testing

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Discuss the quality attributes in detail, to determine the software quality. **(10 Marks)**
b. Explain in details about how identifying test cases is done in software testing. **(10 Marks)**

OR

2 a. With a neat diagram of a testing life cycle explain following:
i) Fault ii) Failure iii) Incident iv) Test case **(10 Marks)**
b. Explain Testing and Debugging cycle with a diagram. **(10 Marks)**

Module-2

3 a. Explain test case for the triangle problem with respect to decision table based testing with examples. **(12 Marks)**
b. What are Decision Tables? Draw the Decision table for triangle problem. **(08 Marks)**

OR

4 a. List and explain equivalence class testing with diagram write equivalence class test case for triangle problem. **(12 Marks)**
b. With examples explain boundary value analysis with respect to
i) Generalizing boundary value analysis
ii) Limitations of boundary value analysis. **(08 Marks)**

Module-3

5 a. Explain in detail about McCabe's basis path method using graph theory. **(08 Marks)**
b. Explain in detail define/use testing with example. **(12 Marks)**

OR

6 a. Explain about slice based testing in a data flow testing with example. **(10 Marks)**
b. With example explain DD-Paths in path testing. **(10 Marks)**

Module-4

7 a. Explain in detail quality and process in software planning. **(10 Marks)**
b. What is a test oracles? With a neat diagram explain the comparison based test oracles. **(10 Marks)**

OR

8 a. What is Scaffolding? Distinguish between Generic Versus Specific Scaffolding. **(08 Marks)**
b. Explain the basic principles process frame work. **(12 Marks)**

Module-5

9 a. Describe decomposition based integration and its goals. Explain the different types of decomposition based on integration. **(08 Marks)**
b. Explain different types of testing strategies in integration testing. **(12 Marks)**

OR

10 a. Describe basic problem of regression test in integration testing. **(10 Marks)**
b. Explain the following: i) Acceptance testing ii) System testing. **(10 Marks)**

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17CS553

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Advanced Java and J2EE

Time: 3 hrs. Max. Marks: 100

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

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-1

1 a. Illustrate with an example how enumerations are declared and used in Java programming. Also list out the enumeration restrictions. **(08 Marks)**

b. Describe Auto-boxing and Un-boxing and how it is different from boxing and unboxing. Illustrate with an example. **(06 Marks)**

c. Justify, Java enumerations is a class type with an example. **(06 Marks)**

OR

2 a. With a syntax and example, explain how annotations are created and obtained at runtime. **(07 Marks)**

b. Discuss how reflections can be used at run time with annotations. **(06 Marks)**

c. What do you mean by Type wrapper and explain numeric type wrapper with an example? **(07 Marks)**

Module-2

3 a. Demonstrate linked lists for collections with example. **(07 Marks)**

b. Explain how collections can be accessed using iterator. **(06 Marks)**

c. Write a program to explain Linked list to store address. **(07 Marks)**

OR

4 a. Explain the following Legacy classes with example :
(i) Hash table (ii) Vector **(08 Marks)**

b. Discuss the following collection integers set and list. **(06 Marks)**

c. What is a Collection Frame work? Explain the methods defined by collection interface. **(06 Marks)**

Module-3

5 a. Explain with syntax and example the different constructors available for creating string. **(08 Marks)**

b. Explain the following methods defined for character extraction with example,
(i) charAt ( ) (ii) getChars ( ) (iii) getBytes ( ) (iv) toCharArray ( ) **(08 Marks)**

c. Write a program to remove duplicate characters from a given string and display the resultant string. **(04 Marks)**

OR

6 a. Explain how to modify a string by using following methods:
(i) substring ( ) (ii) concat ( ) (iii) replace ( ) (iv) trim ( ) **(10 Marks)**

b. Explain the following with syntax and example :
(i) equals ( ) and equalsIgnoreCase ( )
(ii) regionMatches ( )
(iii) startsWith ( ) and endsWith ( )
(iv) equals( ) versus == **(10 Marks)**

Module-4

7 a. Explain how cookies can be handled using servlets. **(07 Marks)**

b. Explain different JSP tags with a program to demonstrate all tags. **(08 Marks)**

c. Explain the life cycle of a servlet. **(05 Marks)**

OR

8 a. Write a Java Servlet program to accept two parameters from webpage, find the sum of them, display the result in webpage. Also give necessary Html script to create webpage. **(10 Marks)**

b. What is the role of Tomcat server? Explain different steps involved in configuring for development of Servlet program execution. **(10 Marks)**

Module-5

9 a. Briefly explain the different types of JDBC drivers. **(10 Marks)**

b. Explain various steps of JDBC process with code Snippets. **(10 Marks)**

OR

10 a. Illustrate with an example how to enable Resultset as scrollable.end describe the significance of scrollable Resultset. **(08 Marks)**

b. Explain the types of exceptions occurred in JDBC with example. **(04 Marks)**

c. Explain (i) PreparedStatement object. (ii) CollableStatement object. **(08 Marks)**

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17CS564

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Dot Net Framework for Application Development

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 general structure of C# program with suitable example. **(06 Marks)**

b. With programming example, explain expression bodied methods and string interpolation in C#. **(08 Marks)**

c. Write a C# program to check whether the number read from the user is a strong number or not. (Hint : A number is called strong number if sum of the factorial of its digits is equal to number itself). **(06 Marks)**

OR

2 a. Explain the concept of named arguments and optional parameters with programming example. **(06 Marks)**

b. Define exception. Explain how exception handling is achieved in C#. **(08 Marks)**

c. Write a C# program to find the roots of a quadratic equation by reading the coefficients from the user. **(06 Marks)**

Module-2

3 a. Explain the concept of Boxing and Unboxing with an example. **(06 Marks)**

b. Define class and structure. Give the difference between structure and class. **(08 Marks)**

c. Illustrate the concept of static data, with C# program that counts the number of objects being created by a class. **(06 Marks)**

OR

4 a. Explain value type and reference type with an example. **(06 Marks)**

b. Explain Anonymous classes, with an example. **(06 Marks)**

c. Define Jagged Array. Explain with program hour jagged arrays are declared, populated and computer the sum of all elements. **(08 Marks)**

Module-3

5 a. Explain the concept of parameter arrays with programming example. **(06 Marks)**

b. What is inheritance? What are the advantages and disadvantages of inheritance? Explain usage of base keyword in inheritance. **(08 Marks)**

c. Explain how method overriding is achieved in C# with programming example. **(06 Marks)**

OR

6 a. Explain with example abstract and sealed keyword with respect to class and methods. **(10 Marks)**

b. Explain the steps taken by the garbage collector to destroy objects. **(05 Marks)**

c. Mention the difference between interface and class. **(05 Marks)**

Module-4

7 a. Define property with its syntax. List and explain with example different types of properties. **(10 Marks)**

b. List and explain different operators used to access and manipulate individual bits in 'int' type. **(05 Marks)**

c. Define generic. Write a C# program for swapping of 2 numbers using generic method. **(05 Marks)**

OR

8 a. Explain the Stack<T> and LinkedList<T> collection class with programming example. **(12 Marks)**

b. Define indexer with its syntax. What are the uses of indexers? Demonstrate with an example. **(08 Marks)**

Module-5

9 a. Define Delegate. Explain how to declare delegate with an example. **(10 Marks)**

b. Define event. Explain how to handle event by using a delegate with an example. **(10 Marks)**

OR

10 a. What is LINQ? Explain LINQ for selecting and ordering of data with an programming example. **(10 Marks)**

b. Explain operator overloading and their constraints. Write the complete C# program that creates a class called 'COMPLEX' which simulates a complex number and overloads the operators '+', '–' and '*' for COMPLEX objects. **(10 Marks)**

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15CS/IS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Define management, Briefly explain the characteristics of management. **(10 Marks)**
b. Explain levels of management with a neat diagram. **(06 Marks)**

OR

2 a. What is planning, explain the importance of planning. **(08 Marks)**
b. Explain steps involved in planning. **(08 Marks)**

Module-2

3 a. Discuss the process of selection and recruitment. **(10 Marks)**
b. Based on the authority what are the different leadership styles explain. **(06 Marks)**

OR

4 a. Explain different motivational theories. **(10 Marks)**
b. What is communication, explain its importance. **(06 Marks)**

Module-3

5 a. Explain types of entrepreneurship based on innovation and others. **(10 Marks)**
b. Discuss the role of entrepreneurs in economic development of a country. **(06 Marks)**

OR

6 a. What are the steps involved in identification of business opportunities. **(06 Marks)**
b. Write a short notes on : i) Market feasibility study
ii) Technical feasibility study. **(10 Marks)**

Module-4

7 a. Explain significance and contents of project report. **(10 Marks)**
b. Briefly discuss about project identification. **(06 Marks)**

OR

8 a. What is supply management explain with a neat diagram. **(06 Marks)**
b. Explain steps involved in report writing. **(10 Marks)**

Module-5

9 a. Illustrate steps involved in establishing Micro and Small Scale Industries. **(10 Marks)**
b. Explain characteristics of small and micro industries. **(06 Marks)**

OR

10 a. Explain MSME–DI and NSIC. **(10 Marks)**
b. What Intellectual Property Rights explain in detail? **(06 Marks)**

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15CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 the following terms : Reliable Data Transfer , Loss tolerant applications , Bandwidth sensitive applications , Elastic applications. **(08 Marks)**

b. Explain how recursive queries are resolved in Domain Name System. Illustrate DNS record structure and list any two types of records. **(08 Marks)**

OR

2 a. Discuss Socket Communication between two processes that communicate over Internet with a block diagram. **(08 Marks)**

b. Explain (HTTP) Hyper Text Transfer Protocol request – response behavior. **(08 Marks)**

Module-2

3 a. Describe why an application developer might choose to run an application over UDP rather than TCP. **(08 Marks)**

b. Draw finite state machines for both sender side and receiver side of Go – back – N protocol and explain. **(08 Marks)**

OR

4 a. Explain the structure of UDP and illustrate with an example the checksum calculation. **(08 Marks)**

b. Explain TCP connection management with time line diagrams. **(08 Marks)**

Module-3

5 a. Describe a high level view of a generic router architecture. **(08 Marks)**

b. Find the least cost path using Link – State Routing Algorithm in the network given in Fig.Q5(b). Assume node 'u' as the source node. Also state the algorithm. **(08 Marks)**

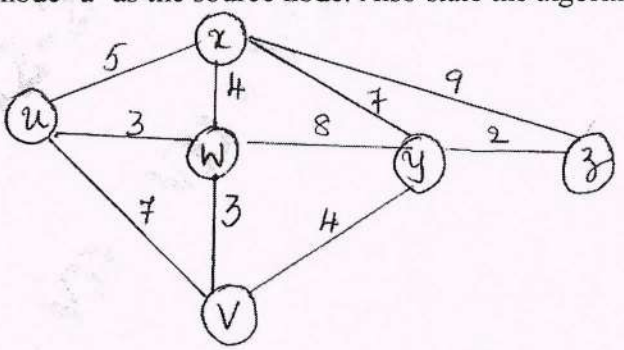

Fig.Q5(b)

OR

6 a. Explain the IPV4 datagram format. **(08 Marks)**

b. Discuss Distance Vector Routing algorithm. Find the least cost by using Distance Vector algorithm with 'u' as the source node in the network given in Fig. Q6(b). Show the routing table for node 'W'. **(08 Marks)**

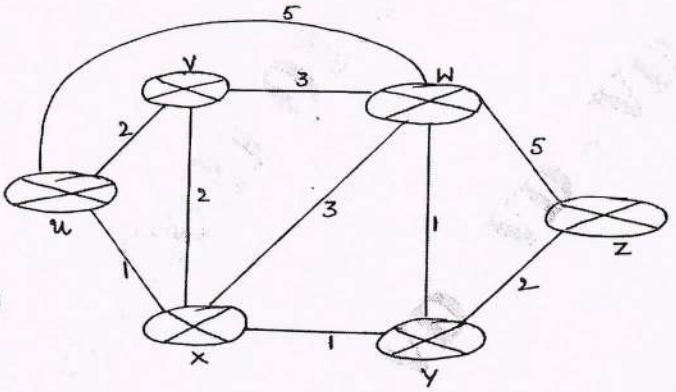

Fig.Q6(b)

Module-4

7 a. Explain 2G Cellular Architecture. **(08 Marks)**

b. What are the initial elements of a Mobile Network Architecture? Bring out the role of Care – of – address, permanent address and foreign address. **(08 Marks)**

OR

8 a. Describe how a call is placed to a mobile GSM user in a visited network. **(08 Marks)**

b. Explain Indirect routing to a mobile node. **(08 Marks)**

Module-5

9 a. Explain the service requirements and design issues in multimedia network applications. **(08 Marks)**

b. Explain Streaming of Stored video over HTTP/TCP. **(08 Marks)**

OR

10 a. What is a Content Distribution Network (CDN)? Explain how DNS is involved in CDN operation. **(08 Marks)**

b. Explain any two scheduling mechanisms as applicable to networks. **(08 Marks)**

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15CS53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 do you mean by Database Management System? Explain the various advantages of using a Database Management System. **(10 Marks)**

b. Describe the three schema architecture with block diagram. Why do we need mappings between schema levels? **(06 Marks)**

OR

2 a. Explain DBMS component modules along with a neat diagram. **(10 Marks)**

b. Define Entity , Entity set, Attribute with respect to ER model. List different types of attributes along with their symbols. **(06 Marks)**

Module-2

3 a. Discuss the Entity integrity and Referential integrity constraints. Why is each considered important? **(06 Marks)**

b. Discuss the following relational algebra operations. Illustrate with an example for each : JOIN , DIFFERENCE , SELECT , UNION. **(10 Marks)**

OR

4 a. Give the E.R to relational mapping algorithm. Discuss each step with an example. **(10 Marks)**

b. Explain the following in SQL :
i) Unspecified WHERE – clause and use of the Asterisk.
ii) Explicit sets and NULLS.
iii) Renaming attributes and joined tables. **(06 Marks)**

Module-3

5 a. Considered the following relations for a database that keeps track of business trips of sales persons in a sale office.
SAILORS (SID, SNAME , RATING , AGE)
BOATS (BID , BNAME, COLOR)
RESERVES (SID , BID , DAY).
Specify the following queries in SQL.
i) Find the names of sailors who have reserved a red or a green boat.
ii) Find the names of sailors who are older than the oldest sailors with a rating of 10.
iii) Find sailors whose rating is better than same sailor called "Ramesh". **(10 Marks)**

b. How does SQL allow implementation of general integrity constraints? **(06 Marks)**

OR

6 a. Describe the concept of a cursor and how it is used in embedded SQL. **(06 Marks)**

b. Explain the term stored procedure and give examples why stored procedures are useful. **(05 Marks)**

c. What are the differences between JDBC and SQLJ? **(05 Marks)**

Module-4

7 a. Explain any two informal quality measures employed for a relational schema design. **(04 Marks)**

b. Explain 1NF , 2NF and 3NF with an example for each. **(12 Marks)**

OR

8 a. Define Multivalued dependency. Explain 4NF, with an example. **(08 Marks)**

b. Define JOIN dependency. Explain 5NF, with an example. **(08 Marks)**

Module-5

9 a. Briefly explain the two phase locking protocol used in concurrency control. **(08 Marks)**

b. What is Schedule? Illustrate with an example. **(05 Marks)**

c. What is Shadow paging scheme? Where it is used? **(03 Marks)**

OR

10 a. Discuss the ACID properties of the database transaction. **(04 Marks)**

b. What is Time stamping? Explain a mechanism of concurrency control that uses time stamping with the help of an example. **(08 Marks)**

c. Write a note on Write ahead log protocol. **(04 Marks)**

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15CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 terms with example:
(i) Length of a string (ii) Reversal (iii) Proper substring
(iv) Language (v) Power of an alphabet **(05 Marks)**

b. Design a FSM to accept set of all strings that either begins or ends or both with substring ab. **(05 Marks)**

c. Convert the given NDFSM to DFSM. (Refer Fig.Q1(c))

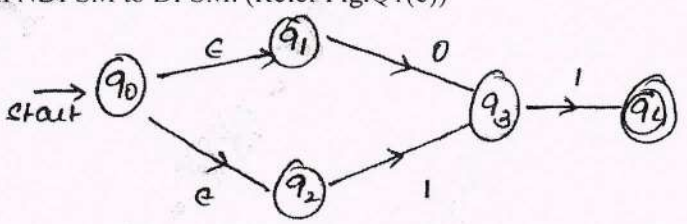

Fig.Q1(c) **(06 Marks)**

OR

2 a. Construct a minimized DFSM for the following: **(08 Marks)**

	↓ A	B	* C	D	E	* F	G	H	* I
0	B	C	D	E	F	G	H	I	A
1	E	F	H	H	I	B	B	C	E

b. Define NDFSM and construct NDFSM for the following languages:
(i) To recognize the following set of strings abc, abd and aacd
(ii) $L = \{w | w \in abab^n$ or aba^n where $n \geq 0\}$
(iii) $L = \{w | w = aba$ or $|w|$ is even$\}$ **(08 Marks)**

Module-2

3 a. Define Regular expression. Obtain a regular expression for the following languages:
(i) $L = \{w : |w|$ is even$\}$
(ii) $L = \{w :$ in w the 5^{th} character from right is a and either character is b$\}$
(iii) $L = \{w :$ w contains both aa and aba as sub string$\}$ **(06 Marks)**

b. Construct FSM for the following RE:
(i) ab (ii) b + (ab) (iii) (b + (ab))* (iv) (babb* + a)* (v) (b + ϵ) (ab)* (a + ϵ) **(10 Marks)**

OR

4 a. Show that for every RE there is an equivalent FSM. **(05 Marks)**

b. Prove that the regular languages are closed under intersection and difference. **(06 Marks)**

c. Obtain RE from the following FSM. (Refer Fig.Q4(c))

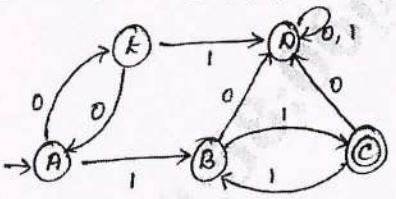

Fig.Q4(c) **(05 Marks)**

Module-3

5 a. Define context free grammar and write CFG for the following languages:
(i) $L = \{a^i b^j c^k : i + j = k, i \geq 0, j \geq 0\}$
(ii) $L = \{a^n b^m c^k : n + 2m = k\}$ **(06 Marks)**

b. Consider the grammar G, with productions:
$S \rightarrow AbB$
$A \rightarrow aA|\in$
$B \rightarrow aB|bB|\in$
Give the left most derivation, rightmost derivation and parse tree for the string aaabab. **(06 Marks)**

c. What is agbigous grammar? Prove that the following grammar is ambiqous on the string aab.
G: $S \rightarrow aS|aSbS|\in$ **(04 Marks)**

OR

6 a. Build a PDA to accept delimiters or balanced paranthesis having paranthesis {, (,) , }. **(08 Marks)**

b. Explain the following terms: (i) Pushdown Automata (PDA) (ii) Languages of a PDA **(04 Marks)**

c. Obtain a CFG for PDA M with the transitions:
$\delta(q_0, a, Z) = (q_0, AZ)$
$\delta(q_0, b, A) = (q_0, AA)$
$\delta(q_0, a, A) = (q_1, \in)$ **(04 Marks)**

Module-4

7 a. State and prove pumping Lemma for context free languages. **(06 Marks)**

b. Prove that $L = \{w \in \{a, b, c\}^* \text{ where } n_a(w) = n_b(w) = n_c(w)\}$ is not context free. **(04 Marks)**

c. Prove that the Context Free Languages are closed under, union and concatenation. **(06 Marks)**

OR

8 a. With a neat diagram, explain the working of a basic TM. **(06 Marks)**

b. Design a TM to accept the following language $L = \{0^n 1^n 2^n \mid n \geq 1\}$ **(10 Marks)**

Module-5

9 Write short notes on:
a. Multi Tape TM
b. Non Deterministic TM
c. Post Correspondence Problem **(16 Marks)**

OR

10 a. Prove that every Language accepted by a multitape TM is accepted by standard TM with single tape. **(06 Marks)**

b. Write note on: (i) Linear Bounded Automata (ii) Recursive Language **(10 Marks)**

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15CS552

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 in detail about Software Quality with respect to Quality Attributes and Reliability. **(08 Marks)**

b. Explain the difference between Requirement Behavior and correctness in Software Testing. **(08 Marks)**

OR

2 a. Explain about Errors and Fault Taxonomies in Software Testing. **(08 Marks)**

b. Explain the levels of abstractions and Testing in Waterfall model in levels of testing. **(08 Marks)**

Module-2

3 a. Explain about the Triangle problems statements with respect to simple version and improved version. Draw the flowchart for the traditional triangle program implementations. **(08 Marks)**

b. Explain about the SATM system and draw the block diagram of SATM terminal and SATM screens. **(08 Marks)**

OR

4 a. Explain the following with test cases for a function of two variables with suitable examples in a Boundary Value Testing.
i) Robustness Testing
ii) Worst Case Testing. **(08 Marks)**

b. Explain the following with test cases in a Decision Table with suitable examples
i) Triangle problem
ii) NextDate functions. **(08 Marks)**

Module-3

5 a. Explain the following :
i) Assumptions in Fault – Based Testing
ii) Mutation Analysis. **(08 Marks)**

b. Explain about Fault Based Adequacy criteria with suitable examples on sample set. **(08 Marks)**

OR

6 a. Explain the following with suitable examples each :
i) Statement Testing
ii) Branch Testing
iii) Condition Testing **(08 Marks)**

b. Explain about McCabe's Basis path method in Basis Path Testing. **(08 Marks)**

Module-4

7 a. Explain the following in details :
   i) Scaffolding
   ii) Test oracles
   iii) Capture and Replay **(08 Marks)**

b. Explain in detail about Dependability properties within a Test and analysis of software process. **(08 Marks)**

OR

8 a. Explain about Risk Management in the Quality plan in a Monitoring the process. **(08 Marks)**

b. Explain the improving the process with respect to :
   i) Structural Testing
   ii) Functional Testing
   iii) System Testing. **(08 Marks)**

Module-5

9 a. Explain about Integration Faults with examples in a Integration and component based Software Testing. **(08 Marks)**

b. Explain about Regression Testing and its selection Techniques. **(08 Marks)**

OR

10 a. Explain the difference between Top Down Integration and Bottom up Integration in a Decomposition Based Integrations. **(08 Marks)**

b. Explain about path Based Integration with respect to New and Extended concepts in a Integration Testing. **(08 Marks)**

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15CS564

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
• 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. Explain the general structure of C# program with an example. **(06 Marks)**

b. How can C# compiler implicity infer the type of a variable? Explain with suitable examples. **(06 Marks)**

c. Explain expression bodied methods with a suitable example. **(04 Marks)**

OR

2 a. Consider the following code :

```
public void DoWorkWithData(int intData, float, floatData, int moreData)
 {
      // some codes
}
```

Suppose it has two more implementations as follows:

```
public void DoWorkWithData (int intData)
{
      // some codes
}
```

and

```
public void DoWorkWithData (int moreData)
{
      // some codes
}
```

This code will fail to compile since it fails to invoke correct overloaded version. How can this issue be solved? **(08 Marks)**

b. Explain try, catch, finally and throw keywords with syntax and an example. **(08 Marks)**

Module-2

3 a. How can you state a class, method and data to be static? Give suitable examples. **(09 Marks)**

b. Explain various ways of copying array elements. **(07 Marks)**

OR

4 a. How does C# facilitate in modifying the original argument passed to a method, when the data it references changes within the method? **(08 Marks)**

b. Explain the concept of boxing and unboxing. **(04 Marks)**

c. Differentiate between class and structure. **(04 Marks)**

Module-3

5 a. Write a C# program that has a class TwoDShape with fields dim1 and dim2 and a method area( ). Create a derived class Triangle and Rectangle that inherits TwoDShape. Override method area ( ) to calculate area of Rectangle and Triangle. **(08 Marks)**

b. Write a C# program having a method to calculate the sum of a variable number of int arguments passed to it and returing the result as an int. **(08 Marks)**

OR

6 a. How is multiple inheritance supported in C#? Explain with an example. **(08 Marks)**
b. What is the need for garbage collector? How does it work? **(08 Marks)**

Module-4

7 a. Explain set and get access method with an example. **(08 Marks)**
b. Define indexer with an example. Demonstrate with an example. **(08 Marks)**

OR

8 a. What is the use of generic classes? Write a C# program for swapping :
(i) Two integers (ii) Two characters, using generic method. **(08 Marks)**
b. Explain Stack<T> collection class with an example. **(08 Marks)**

Module-5

9 a. Define delegate. How is it declared? Explain with an example. **(07 Marks)**
b. Write Language Integrated Query(LINQ) to select, filter and order data. **(09 Marks)**

OR

10 a. How does .NET facilitate to define and trap significant actions and arrange for a delegate to be called? **(08 Marks)**
b. Write a C# program for overloading + operator. **(08 Marks)**

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15CS664

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Explain the computer hardware architecture with a neat sketch. **(06 Marks)**

b. Write a note on general types of errors. **(06 Marks)**

c. Write a program that uses input to prompt a user for their name and then welcomes them. **(04 Marks)**

OR

2 a. Write a program which prompts the user for a Celsius temperature, convert the temperature to Fahrenheit and print the converted temperature. **(06 Marks)**

b. Explain nested conditional statement with an example. **(04 Marks)**

c. Write a program with a function computer grade that takes a score as its parameter and returns a grade as a string. **(06 Marks)**

Module-2

3 a. Analyze the use of break and continue statement with an example. **(06 Marks)**

b. Explain format operators in python with suitable examples. **(03 Marks)**

c. Define a file data structure. Illustrate reading and writing operation on files with examples. **(07 Marks)**

OR

4 a. Write a program to read numbers repeatedly until the user enters 'done'. Once 'done' is entered print out total, count and average of the numbers. **(06 Marks)**

b. Write a note on string methods. **(07 Marks)**

c. Write a program to read through a file and print the contents of the file (line by line) all in upper case. **(03 Marks)**

Module-3

5 a. Explain list operations and list methods with examples. **(05 Marks)**

b. Write a program to count how many times each letter appears in a word. **(07 Marks)**

c. Explain tuple assignment with examples. **(04 Marks)**

OR

6 a. Write a program to open a file and read it line by line. For each line, split the line into list of words using split function. For each word check to see if the word is already in a list. If the word is not in the list, add it to the list. **(06 Marks)**

b. Explain advanced text parsing using dictionary. **(07 Marks)**

c. Why search and find all functions of regular expressions used? Explain with suitable examples. **(03 Marks)**

Module-4

7 a. Define class. Explain classes and objects of python in detail with suitable examples. **(10 Marks)**

b. What is a pure function? Explain with an example. **(06 Marks)**

OR

8 a. Write a program with a function print_time that takes a time object and prints it in the form hour:minute:second. Write another function is_after that takes two time objects t_1 and t_2 and resume True if t_1 follows t_2 chronologically and False otherwise. **(08 Marks)**

b. Write a note on operator overloading with an example. **(08 Marks)**

Module-5

9 a. How to retrieve web pages using urllib? Explain how to compute frequency of each word in the file retrieved. **(08 Marks)**

b. What is an API? Explain with a neat sketch. **(08 Marks)**

OR

10 a. Write a program to read binary files. **(08 Marks)**

b. Explain keys in a database model. **(08 Marks)**

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