

CBCS SCHEME

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15CS51

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Explain functions of management in detail (08 Marks)
b. Explain nature and characteristics of management in detail. (08 Marks)

OR

- 2 a. Explain the levels of management. (08 Marks)
b. List the difference between administration and management. (04 Marks)
c. Explain the roles of Managers in detail. (04 Marks)

Module-2

- 3 a. Define Leadership. Explain leadership styles. (08 Marks)
b. Explain Herzberg's Hygiene theory. (08 Marks)

OR

- 4 a. Explain techniques of coordination. (08 Marks)
b. Explain steps in control process in detail. (08 Marks)

Module-3

- 5 a. Write the characteristics of Entrepreneurship and functions of entrepreneur. (08 Marks)
b. Explain types of Entrepreneurship in detail. (08 Marks)

OR

- 6 a. List the difference between Entrepreneur and Entrepreneurship. (04 Marks)
b. Explain stages of Entrepreneurial process in detail. (08 Marks)
c. Explain barriers to entrepreneurship. (04 Marks)

Module-4

- 7 a. Enumerate the content of Project report. (08 Marks)
b. Define ERP and explain its importance. (08 Marks)

OR

- 8 a. Define Project report and explain significance of report. (08 Marks)
b. Explain steps involved in Project report writing. (08 Marks)

Module-5

- 9 a. List the functions of DIC's. (08 Marks)
b. Explain KSSIDC. (08 Marks)

OR

- 10 a. List the characteristics of small scale industries. (08 Marks)
b. Explain trademark, copy rights and patents. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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15CS52

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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 client server and peer-to-peer architecture. (08 Marks)
b. Describe HTTP with persistent and non-persistent connections. (08 Marks)

OR

- 2 a. Discuss how files are distributed in peer-to-peer application. (08 Marks)
b. Demonstrate socket implementation using TCP. (08 Marks)

Module-2

- 3 a. With a diagram, explain the connection-oriented multiplexing and de-multiplexing. (06 Marks)
b. Elaborate the three way handshaking in TCP. (05 Marks)
c. Discuss Go-Back N protocol. (05 Marks)

OR

- 4 a. With a neat sketch, explain the TCP segment and its services. (08 Marks)
b. Design rdt 2.0 protocol. (08 Marks)

Module-3

- 5 a. With general format, explain various fields of IPV6. (08 Marks)
b. Define routing algorithm. List the broadcast routing algorithms. Explain any one of them. (08 Marks)

OR

- 6 a. Illustrate Routing Information Protocol (RIP) with suitable diagram. (08 Marks)
b. Explain the spanning tree algorithm and give its advantages and disadvantages. (08 Marks)

Module-4

- 7 a. With a diagram, explain various components of GSM 2G cellular network architecture. (08 Marks)
b. With a diagram, explain the following with respect to mobile IP:
(i) Agent discovery (ii) Registration with the home agent (08 Marks)

OR

- 8 a. Illustrate the steps involved when a base station does decide to hand-off a mobile user. (08 Marks)
b. Compare mobile IP and GSM mobility. (04 Marks)
c. With a diagram, explain the problem and its solution in direct routing. (04 Marks)

Module-5

- 9 a. With a neat diagram, explain the CDN operation. (08 Marks)
b. Briefly explain the properties of Video and Audio. (08 Marks)

OR

- 10 a. Explain the working procedure of leaky bucket algorithm. (08 Marks)
b. Discuss the followings: (i) Adaptive streaming (ii) DASH (08 Marks)

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15CS53

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Discuss the main characteristics of the database approach and how it differs from traditional file systems. (08 Marks)
- b. Explain the component module of DBMS and their interactions with the help of neat diagram. (08 Marks)

OR

- 2 a. Draw an ER-diagram for AIRLINE database schema with atleast five entity types and specify primary key and structural constraints and weak entity type. (10 Marks)
- b. Define the following terms:
 - i) Weak entity type
 - ii) Degree of a relationship type
 - iii) Role names and recursive relationship. (06 Marks)

Module-2

- 3 a. Discuss the different types of update operations on relational database. Explain how the basic operations deals with constraint violations. (08 Marks)
- b. Explain the data types available for attribute specification in SQL. (08 Marks)

OR

- 4 a. Consider the two tables T₁ and T₂. Show the results of the following operations:

T ₁			T ₂		
P	Q	R	A	B	C
10	a	5	10	b	6
15	b	8	25	c	3
25	a	6	10	b	5

- i) $T_1 \bowtie_{T_{1,P}=T_{2,A}} T_2$
- ii) $T_1 \bowtie_{T_{1,Q}=T_{2,B}} T_2$
- iii) $T_1 \bowtie_{T_{1,P}=T_{2,A}} T_2$
- iv) $T_1 \bowtie_{T_{1,Q}=T_{2,B}} T_2$
- v) $T_1 \bowtie_{(T_{1,P}=T_{2,A}) \wedge (T_{1,R}=T_{2,C})} T_2$ (10 Marks)
- b. Explain Unary relational operations with an example. (06 Marks)

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Module-3

- 5 Consider the following schema of order database
 SALESMAN (Salesmanid, name, city, commission);
 CUSTOMER (Custid, custname, city, grade, salesmanid);
 ORDERS (Ordno, purchaseamt, orddate, custid, salesmanid);
 Write SQL queries for the following:
- Find the name and numbers of all salesman who had more than one customer.
 - Count the customers with grade above Bangalore's average.
 - List all the salesman details whose first name is 'John'.
 - List all salesman and indicate those who have and don't have customers in their cities (Use UNION operation).
 - Use the delete operation by removing salesman with id = 2000. (16 Marks)

OR

- 6 a. Explain three-tier architecture with neat diagram. (08 Marks)
 b. Define stored procedure. Explain creating and calling of stored procedure with an example. (08 Marks)

Module-4

- 7 a. Define normal form. Explain 1NF, 2NF and 3NF with suitable example. (08 Marks)
 b. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with example. (08 Marks)

OR

- 8 a. Explain the four informal guidelines that may be used as measures to determine the quality of relation schema design. (08 Marks)
 b. Write an algorithm for finding a minimal cover 'F' for a set of functional dependencies 'E'. Find the minimal cover for the given set of FD's
 G: {A → BCDE, CD → E} (08 Marks)

Module-5

- 9 a. Discuss the atomicity, durability, isolation and consistency preserving properties of a database transaction. (08 Marks)
 b. Why concurrency control is needed demonstrate with example? (08 Marks)

OR

- 10 a. Discuss Two-Phase Locking Technique for concurrency control. (10 Marks)
 b. Explain NO-UNDO/REDO Recovery based on deferred update. (06 Marks)

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15CS54

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 80

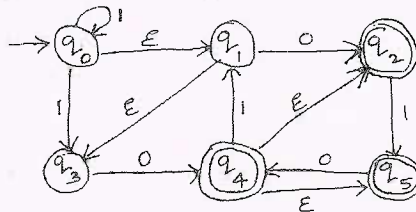
Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

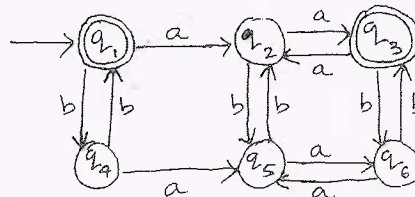
- 1 a. Briefly describe the applications of Theory of computation. (04 Marks)
- b. Define DFSM. Build DFSM for the following languages.
 - i) $L = \{w \in \{a, b\}^* : \text{every } a \text{ in } w \text{ is immediately followed by } b\}$
 - ii) $L = \{w \in \{a, b\}^* : w \text{ does not contain substring } aab\}$. (08 Marks)
- c. Describe Machine based hierarchy of language classes. (04 Marks)

OR

- 2 a. For the following NDFSM, use ndfsmtoDFSM to construct an equivalent DFSM. Begin by showing the value of $\epsilon(q)$ for each state q : (08 Marks)

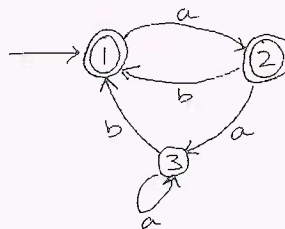


- b. Let M be the following DFSM. Use minDFSM to minimize M. (08 Marks)



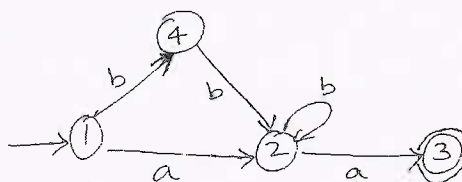
Module-2

- 3 a. Define Regular Expression. Write regular expression for the following :
 - i) $L = \{w \in \{a, b\}^* : w \text{ does not end in } ba\}$
 - ii) $L = \{w \in \{0-9\}^* : w \text{ corresponds to the decimal encoding, without leading } 0\text{'s, of an odd natural number}\}$. (06 Marks)
- b. Consider the FSM M. Use the fsmtoRegEx heuristic algorithm to construct a regular expression that describes $L(M)$. (05 Marks)



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- c. Consider the FSM M. Use fsmtoregex algorithm to construct a regular expression that describes $L(M)$. (05 Marks)



OR

- 4 a. Show that regular languages are closed under complement and set difference. (06 Marks)
 b. State and prove pumping lemma theorem for regular languages. And show that the language $L = \{a^n b^n : n \geq 0\}$ is not regular. (10 Marks)

Module-3

- 5 a. Define CFG. Design CFG for the languages.
 i) $L = \{a^i b^j \mid 2i = 3j + 1\}$ ii) $L = \{0^{n^2} 1^n \mid n \geq 1\}$. (08 Marks)
 b. Define Chomsky Normal form. Convert the following CFG to CNF.
 $S \rightarrow aACa$
 $A \rightarrow a \mid B$
 $B \rightarrow C \mid c$
 $C \rightarrow cC \mid E$. (08 Marks)

OR

- 6 a. Define Ambiguity. Consider the grammar $E \rightarrow +EE \mid *EE \mid -EE \mid x \mid y$. Find the leftmost, rightmost derivations and parse trees for the string “+ * - xyxy”. (07 Marks)
 b. Define PDA. Design a PDA to accept the following language.
 $L = \{ww^R : w \in \{a, b\}^*\}$. Draw the transition diagram for the constructed PDA. (09 Marks)

Module-4

- 7 a. Design a TM to accept the language $L = \{a^n b^n \mid n \geq 1\}$. Obtain the transition table and transition diagram. Also show the instantaneous description for the string “aabb”. (11 Marks)
 b. Explain the working principle of TM with diagram. (05 Marks)

OR

- 8 a. State and prove pumping theorem for CFL's shown that the language $L = \{a^n b^n c^n : n \geq 0\}$ is not context free. (10 Marks)
 b. Explain the hierarchy within the class of CFL's (hierarchy of languages). (03 Marks)
 c. Show that CFL's are closed under reverse. (03 Marks)

Module-5

- 9 a. Explain Multitape TM, with diagram. (05 Marks)
 b. Prove that every language accepted by a multitape TM is acceptable by some standard TM. (06 Marks)
 c. Explain the model of Linear Bounded Automata. (05 Marks)

OR

- 10 Write short notes on :
 a. Undecidable languages.
 b. Halting problem of TM.
 c. Post correspondence problem.
 d. Church – Turing Thesis. (16 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Introduction to Software Testing

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define Test-case. Explain test-case information with sample template. (08 Marks)
b. Discuss the types of test metrics used in software testing, in detail. (08 Marks)

OR

- 2 a. Define testing. Explain debugging cycle with diagram. (08 Marks)
b. Distinguish between specification based testing and code-based testing. (08 Marks)

Module-2

- 3 a. Draw the display screens of both Simple Automatic Teller Machine (SATM) terminal and built with fifteen screens for the SATM system. (08 Marks)
b. Draw the data-flow diagram for structure triangle program implementation. (08 Marks)

OR

- 4 a. Discuss in detail, the systematic procedure for equivalence partitioning method. (08 Marks)
b. Explain about decision tables, construct decision table of triangle, is accepts three integer a, b and c are side inputs, equilateral, scalene, isosceles, or not a triangle and satisfy the following conditions $a < b + c$, $b < a + c$ and $c < a + b$. (08 Marks)

Module-3

- 5 a. Explain the following : i) Test case ii) Test suite
iii) Test adequacy criteria iv) Test case specification. (08 Marks)
b. Explain mutation analysis terminologies. (08 Marks)

OR

- 6 a. What is path testing? Explain briefly different path testing strategies. (08 Marks)
b. Define the various data flow criteria. (08 Marks)

Module-4

- 7 a. Write a note on : i) Partition ii) Feedback iii) Restriction iv) Redundancy. (08 Marks)
b. With reference to test execution, explain the concept of scaffolding and test oracles. (08 Marks)

OR

- 8 a. Explain the following : i) Quality process ii) Quality goals. (08 Marks)
b. Explain about : i) Task schedule ii) Quality team. (08 Marks)

Module-5

- 9 a. Write a short note on :
i) Stress testing ii) Regression testing iii) Acceptance testing iv) Unit testing. (08 Marks)
b. Explain the following in terms of integration testing :
i) Top-Down ii) Bottom-Up iii) Sandwich iv) Threads. (08 Marks)

OR

- 10 a. Explain testing components and assemblies. (08 Marks)
b. Explain pair-wise integration testing with example. (08 Marks)

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15CS553

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Advanced JAVA and J2EE

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is enum? With a program, explain how enumeration is used as class. (09 Marks)
b. What is autoboxing? Write a program to illustrate how auto boxing occurs in methods and explain briefly. (07 Marks)

OR

- 2 a. What are annotations? List different built-in annotations. Explain any one. (04 Marks)
b. Define Marker annotation and single member annotation with an example. (04 Marks)
c. Write a program to obtain annotations at runtime by use of reflection. (08 Marks)

Module-2

- 3 a. What is collection framework? Explain collection interface and its methods. (08 Marks)
b. Write a java program to create an ArrayList of objects of type string. Add any five strings, display size and contents of list. Remove any two strings and display size and contents. (08 Marks)

OR

- 4 a. Write a note on TreeMap class. (06 Marks)
b. What are comparators? Explain briefly. (05 Marks)
c. Explain vector class with an example. (05 Marks)

Module-3

- 5 a. What is string? Explain different string constructors. (07 Marks)
b. Write a java program to sort array of strings using compareTo() function. (05 Marks)
c. Write a short note on replace() and substring() methods of StringBuffer class. (04 Marks)

OR

- 6 a. Write a program in java to replace all the matching substring with a given string. (06 Marks)
b. Explain indexOf() and lastIndexOf() methods of string class with an example. (05 Marks)
c. Write a note on charAt() and setCharAt() functions of StringBuffer class. (05 Marks)

Module-4

- 7 a. Explain Servlet life cycle with an example. (05 Marks)
b. Define Cookie. Write a Servlet program to add a cookie. (08 Marks)
c. List different classes and interfaces of javax.servlet package. (03 Marks)

OR

- 8 a. What is JSP? Explain different types of JSP tags. (10 Marks)
b. What is session? Explain how to create session attribute using JSP. (06 Marks)

Module-5

- 9 a. Describe the various steps of JDBC with code snippets. (10 Marks)
b. Write a note on Database Metadata and ResultSet metadata. (06 Marks)

OR

- 10 a. Write a note on different types of drivers. (04 Marks)
b. What is ResultSet? How to make ResultSet Scrollable. (04 Marks)
c. Write a Java program to execute database transaction. (08 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Artificial Intelligence

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is Artificial Intelligence? List the task domains of Artificial Intelligence. (05 Marks)
 b. Explain Depth-First search algorithm with an example. (05 Marks)
 c. Explain Means-Ends analysis with an example. (06 Marks)

OR

- 2 a. A water jug problem states "you are provided with two jugs, first one with 4-gallon capacity and the second one with 3-gallon capacity. Neither have any measuring markers on it. How can you get exactly 2-gallons of water into 4-gallon jug?"
 i) Write down the production rules for the above problem.
 ii) Write any one solution to the above problem. (08 Marks)
 b. Explain problem characteristics with respect to heuristic search. (08 Marks)

Module-2

- 3 a. Explain property inheritance algorithm with example. (06 Marks)
 b. Write the algorithm for conversion to clause form. (10 Marks)

OR

- 4 a. Explain forward versus Backward Reasoning with examples. (08 Marks)
 b. List the issues in knowledge representation. (04 Marks)
 c. Define Horn clause and give the syntactic difference between PROLOG and logic. (04 Marks)

Module-3

- 5 a. Explain Dempster-Shafer theory with example. (06 Marks)
 b. Explain Partitioned Semantic Nets with example. (06 Marks)
 c. Briefly explain the motivation for fuzzy logic. (04 Marks)

OR

- 6 a. Explain Bayesian network in detail. (08 Marks)
 b. Write a note on Dependency-Directed Backtracking. (08 Marks)

Module-4

- 7 a. Define Conceptual Dependency. List the rules of conceptual dependency. (08 Marks)
 b. Write the algorithm for minimax (position, depth, players) and explain. (08 Marks)

OR

- 8 a. What is a script? What are the components of a script? Write the Restaurant Script. (10 Marks)
 b. Write the algorithm for: (i) Depth first iterative deepening (ii) Iterative deepening – A*. (06 Marks)

Module-5

- 9 a. Explain the different steps in natural language understanding process. (08 Marks)
 b. Explain candidate elimination algorithm with example. (08 Marks)

OR

- 10 a. Explain knowledge acquisition. (10 Marks)
 b. Explain the classification of spell checking techniques. (06 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

•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. Define exception. With syntax and code snippets, explain try, catch, throw and finally used in exception handling. (09 Marks)
- b. Explain with code snippets optimal parameters and named arguments. (07 Marks)

OR

- 2 a. Differentiate between break and continue statements with code snippets. (02 Marks)
- b. With example, explain checked and unchecked statements and expressions. (06 Marks)
- c. Write a C# program to perform the following: Read marks obtained for 3 subjects, calculate average and display grade according to the following cases. Use switch statement.
70 ≤ avg ≤ 80 → "outstanding"
60 < avg ≤ 69 → "First class"
50 < avg ≤ 59 → "Second class"
40 < avg ≤ 49 → "Average class"
Otherwise → "Fail class" (08 Marks)

Module-2

- 3 a. Demonstrate Boxing and unboxing with code snippets. (06 Marks)
- b. Discuss two different operators to cast data safely in C#. Give examples. (06 Marks)
- c. Differentiate between class and structure. (04 Marks)

OR

- 4 a. What is a gagged array? Write a C# program to create a gagged array, populate this array with values and to display contents of the same. (06 Marks)
- b. Demonstrate ref and out parameters with suitable examples for each. (10 Marks)

Module-3

- 5 a. Write a C# program to design a method to calculate sum and average of 'n' numbers using params array. (08 Marks)
- b. What is garbage collection? Why it is needed? Explain the steps taken by garbage collector to destroy objects. (08 Marks)

OR

- 6 a. Explain inheritance with examples. How it is used in class? What are the advantages of using inheritance? (06 Marks)
- b. Define and explain abstract class and sealed class. (04 Marks)
- c. What is an interface? How it is defined in C#? Demonstrate with examples how to implement interfaces in class. (06 Marks)

Module-4

- 7 a. Explain two types of properties in C# with syntax and example for each. (06 Marks)
b. Define indexer with syntax. (02 Marks)
c. Write a C# program to create, manipulate and iterate through the contents of List Collection class. Show Add, Remove, RemoveAt and Insert methods. Give necessary comments for each method. (08 Marks)

OR

- 8 a. Write a C# program to demonstrate a generic solution for swapping of 2 integers and swapping of 2 strings. (08 Marks)
b. Differentiate between Dictionary < Tkey, Tvalues > collection class and sorted list < Tkey, Tvalues > collection class. (08 Marks)

Module-5

- 9 a. What is LINQ? With suitable example, explain ordering, grouping and aggregating data. (10 Marks)
b. Explain overloading of increment and decrement operations in C#. (06 Marks)

OR

- 10 a. Demonstrate defining an enumerator by using an iterator. (08 Marks)
b. Explain the concept of declaring an event, subscribing to an event, unsubscribing from an event and raising an event in C#. (08 Marks)

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17CS51

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Define management. Explain the functional areas of management. (10 Marks)
b. Explain the steps involved in planning, and mention the importance and purpose of planning process. (10 Marks)

OR

- 2 a. Explain the contribution of F. W. Taylor to the theory of management. (10 Marks)
b. Explain types of Planning and Organization. (10 Marks)

Module-2

- 3 a. Define leadership. Explain the various leadership styles. (10 Marks)
b. Define staffing. Explain the process of recruitment and selection. (10 Marks)

OR

- 4 a. What is controlling? Explain the steps in controlling. (10 Marks)
b. What is the need for coordination and explain Maslow's hierarchy theory. (10 Marks)

Module-3

- 5 a. Explain various stages in entrepreneurial process. (12 Marks)
b. Explain technical and financial feasibility study. (08 Marks)

OR

- 6 a. List some of the most commonly attributed reasons for the lack of entrepreneurship in India. (10 Marks)
b. Differentiate between Entrepreneur, Intrapreneur and Managers. (10 Marks)

Module-4

- 7 a. Explain the objectives of market research. (10 Marks)
b. List out the various contents of project report. (10 Marks)

OR

- 8 a. Explain the guidelines by Planning Commission for Project Report. (10 Marks)
b. Discuss Enterprise Resource Planning and Supply Chain Management. (10 Marks)

Module-5

- 9 a. Explain the following: (i) NSIC (ii) DIC (iii) NIMSMIET
(iv) NIESBUD (v) KSFC (vi) KIADB (12 Marks)
b. What are the different type of patents and explain them. (08 Marks)

OR

- 10 a. Discuss case study of Microsoft. (10 Marks)
b. Discuss case study of NR Narayanamurthy and Infosys. (10 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Which protocol can be used for fetching web pager? Explain its working with request and response message formats. (10 Marks)
- b. Explain the services offered by DNS and also explain the DNS record and message format. (10 Marks)

OR

- 2 a. Explain the working FTP along with its commands. (08 Marks)
- b. Compare HTTP and SMTP. (04 Marks)
- c. Illustrate how P2P architecture can be adopted in file. Sharing application like bit torrentz. (08 Marks)

Module-2

- 3 a. Draw and explain the FSM for sender site and receiver site of rdt 2.0 protocol. (07 Marks)
- b. Explain selective repeat ARQ protocol. (06 Marks)
- c. Draw TCP segment structure and explain its fields. (07 Marks)

OR

- 4 a. Suppose that two measured sample RTT values are 106ms and 120ms.
 - i) Compute Estimated RTT after each of these Sample RTT value is obtained. Assume $\alpha = 0.125$ and Estimated RTT is 100ms. Just before first of the samples obtained.
 - ii) Compute DeVRTT. Assume $\beta = 0.25$ and DeVRTT is 5ms before first of the samples obtained. (06 Marks)
- b. Explain how connection establishment and termination is handled by TCP. (07 Marks)
- c. What is congestion in network? Explain how TCP handles congestion. (07 Marks)

Module-3

- 5 a. What is routing? With a neat diagram, explain the structure of a router. (10 Marks)
- b. Write link state routing algorithm, consider the following network with the indicated link costs. Apply link state routing algorithm to compute the shortest path from 'u' to all other nodes in the network. [Refer Fig.Q5(b)]. (10 Marks)

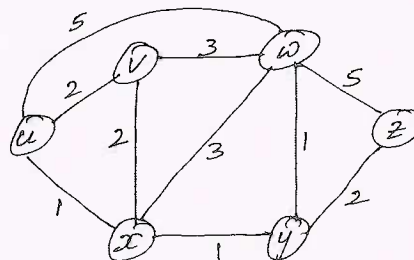


Fig.Q5(b)
1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

- 6 a. Draw IPV6 datagram format. Explain its fields. (06 Marks)
b. Illustrate the working of RIP protocol. (07 Marks)
c. List the broadcast routing algorithm. Explain any one of them. (07 Marks)

Module-4

- 7 a. With a neat diagram, explain the components of 3G cellular network architecture. (10 Marks)
b. Explain two different types of routing approaches to mobile nodes. (10 Marks)

OR

- 8 a. Explain the three phases of mobile IP. (10 Marks)
b. What is handoff? What are the steps involved in accomplishing handoff. (10 Marks)

Module-5

- 9 a. Explain three different types of streaming stored video. (10 Marks)
b. Explain the working of CDN. (10 Marks)

OR

- 10 a. Describe the leaky bucket policing mechanism. (06 Marks)
b. Explain the various packet scheduling mechanism. (08 Marks)
c. Explain the properties of Video. (06 Marks)

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CBCS SCHEME

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17CS53

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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. Compare DBMS and early file systems, bringing out the major advantages of the database approach. (06 Marks)
- b. With a neat block diagram, explain the architecture of a typical DBMS. (10 Marks)
- c. What are the responsibilities of the DBA and the database designers? (04 Marks)

OR

- 2 a. Define the following terms :
i) Data model ii) Schema iii) Instance iv) Canned Transaction. (08 Marks)
- b. Draw an ER diagram to represent the Election Information System based on the following description :
In the Indian national election, a state is divided into a number of constituencies depending upon the population of the state. Several candidates contest elections in each constituency. Candidates may be from some party or independent. The election information system must record the number of votes obtained by each candidate. The system also maintains the voter list and a voter normally belongs to a particular constituency.
Note that the party details must also be taken care in the design. (12 Marks)

Module-2

- 3 a. Define the following terms : i) Key ii) Super key iii) Candidate key
iv) Primary key v) Foreign key. (05 Marks)
- b. Enumerate the steps involved in converting the ER constructs to corresponding relational tables. (07 Marks)
- c. Considering the schema
Sailors (sid, sname, rating, age)
Boats (bid, bname, color)
Reserves (sid, bid, day)
Write relational algebraic queries for the following :
i) Find names of sailors who have reserved boat # 103.
ii) Find names of sailors who have reserved a red boat.
iii) Find names of sailors who have reserved a red or green boat.
iv) Find names of sailors who have reserved all boats. (08 Marks)

OR

- 4 a. Explain with examples, the basic constraints that can be specified when a database table is created in SQL. (12 Marks)
- b. Write SQL queries for the following relational schema :
CUSTOMER (CID, CNAME, EMAIL, ADDR, PHONE)
ITEM (ITEM_NO, ITEM_NAME, PRICE, BRAND)
SALES (CID, ITEM_NO, # ITEMS, AMOUNT, SALE_DATE)
SUPPLIER (SID, SNAME, SPHONE, SADDR)
SUPPLY (SID, ITEM_NO, SUPPLY_DATE, QTY)

1 of 3

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- i) List the items purchased by customer 'Prasanth'.
- ii) Retrieve items supplied by all suppliers starting from 1st Jan 2019 to 30th Jan 2019.
- iii) Get the details of customers whose total purchase of items worth more than 5000 rupees.
- iv) List total sales amount, total items, average sale amount of all items.
- v) Display customers who have not purchased any items. (08 Marks)

Module-3

- 5 a. What are assertions and triggers in SQL? Write a SQL program to create an assertion to specify the constraint that the salary of an employee must not be greater than the salary of the department. The employee works for in the COMPANY database. (07 Marks)
- b. Write a trigger in SQL to call a stored procedure INFORM_SUPERVISOR() whenever a new record is inserted or updated, check whether an employee's salary is greater than the salary of his or her direct supervisor in the COMPANY database. (07 Marks)
- c. How do you create a view in SQL? Give examples. Can you update a view table? If yes, how? If not, why not? Discuss. (06 Marks)

OR

- 6 a. With real world examples, explain the following : i) JDBC ii) Correlated queries
iii) Stored Procedure iv) Schema change statements in SQL. (12 Marks)
- b. Write a complete high level language program (in Java or C) to display the rows of a customer table created in oracle having < custid, custname, balance > columns with embedded SQL. (08 Marks)

Module-4

- 7 a. What are the problems caused by insertion, updation and deletion anomalies? Discuss with an example. (06 Marks)
- b. For the below given relation R (A, B, C, D, E) and its instance, check whether the FDs given hold or not. Give reasons.
i) $A \rightarrow B$ ii) $B \rightarrow C$ iii) $D \rightarrow E$ iv) $CD \rightarrow E$. (04 Marks)

A	B	C	D	E
a ₁	b ₁	c ₁	d ₁	e ₁
a ₁	b ₂	c ₁	d ₁	e ₁
a ₂	b ₂	c ₁	d ₂	e ₃
a ₂	b ₃	c ₃	d ₂	e ₂

- c. Using the minimal cover algorithm, find the minimal cover for the following FDs :
 $F = \{AB \rightarrow C, A \rightarrow D, BD \rightarrow C, D \rightarrow BG, AE \rightarrow F\}$. (10 Marks)

OR

- 8 a. Normalize the below relation upto 3NF :

Module	Dept	Lecturer	Text
M1	D1	L1	T1
M1	D1	L1	T2
M2	D1	L1	T1
M2	D1	L1	T3
M3	D1	L2	T4
M4	D2	L3	T1
M4	D2	L3	T5
M5	D2	L4	T6

(10 Marks)

- b. Define Multi valued Dependency and Join Dependency. Explain 4NF and 5NF with examples. (10 Marks)

Module-5

- 9 a. Describe the database inconsistency problems : Lost update , dirty read and blind write. (06 Marks)
- b. With a neat diagram, explain the various states of a transaction execution. (07 Marks)
- c. Check whether the below schedule is conflict serializable or not.
{b2 , r2(X) , b1 , r1(X) , w1(X) , r1(Y) , w1(Y) , w2(X) , e1, c1, e2, c2}. (07 Marks)

OR

- 10 a. What is 2PL? Explain with an example. (06 Marks)
- b. How do you detect a deadlock during concurrent transaction execution? (06 Marks)
- c. Explain the various database recovery techniques, with examples. (08 Marks)

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17CS54

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1** a. Explain with example,
 (i) Strings (ii) Language (iii) Function on string (06 Marks)
 b. Discuss standard operations on Languages with example. (04 Marks)
 c. Construct DFSM for the following languages :
 (i) $L = \{\omega \in \{a, b\}^* \mid \omega \text{ contains no more than one } b\}$
 (ii) $L = \{\omega \in \{a, b\}^* \mid \omega \text{ contains Even number of } a\text{'s and odd number of } b\text{'s}\}$
 Give the transition Table and show that aabaa is accepted. (10 Marks)

OR

- 2** a. Convert the following ϵ -NFSM to DFSM by eliminating ϵ -transition.

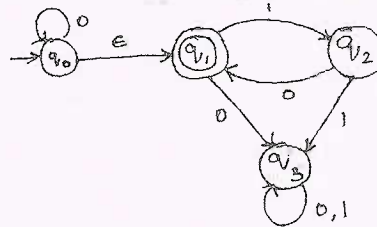


Fig. Q2 (a)

- b. Define distinguishable and indistinguishable states. Minimize the number of states in DFSM. (10 Marks)

δ	0	1
$\rightarrow A$	B	F
B	G	C
C	A	G
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

(10 Marks)

Module-2

- 3** a. Define Regular expression. Write RE for the following :
 (i) Language of all strings of 0's and 1's that have odd number of 1's.
 (ii) Language of all strings of 0's and 1's that has at least one pair of consecutive 0's.
 (iii) The Language of all strings of 0's and 1's that have no pair's of consecutive 0's. (10 Marks)
 b. Prove with an example that the class of language can be defined with regular Grammar is exactly the regular language. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

- 4 a. Using Kleen's theorem, prove that any language that can be defined with a Regular expression can be accepted by some FSM. (10 Marks)
- b. State and prove pumping lemma for regular language and show that the language $L = \{a^p \mid p \text{ is a prime number}\}$ is not regular. (10 Marks)

Module-3

- 5 a. Define context Free Grammar. Construct CFG for the following languages:
 (i) Balanced parantheses.
 (ii) $L = \{\omega \in \{a,b\}^* \mid \omega \text{ contains substring } ab\}$ and derive two strings for each language along with parse tree. (10 Marks)
- b. Explain deterministic PDA and construct DPDA for language given and give the trace for the string abbaab and aababb.
 $L = \{a^n b^m a^m b^n \mid m, n > 0 \text{ and } n \neq m\}$. (10 Marks)

OR

- 6 a. Discuss Chomsky normal form and Greibach normal form. Convert the following Grammar to Chomsky Normal form,
 $S \rightarrow aACa$
 $A \rightarrow B \mid a$
 $B \rightarrow C$
 $C \rightarrow cC \mid \epsilon$ (10 Marks)
- b. Explain Non deterministic PDA and construct an NPDA for the language.
 $L = \{\omega\omega^R \mid \omega \in \{a,b\}^*\}$
 Give the transition diagram and show the trace for a string abaaba. (10 Marks)

Module-4

- 7 a. State pumping Lemma for context free language. (10 Marks)
- b. Define Turing Machine. Design TM to accept the language $L = \{a^n b^n c^n \mid n \geq 1\}$. Draw the transition diagram and show the moves made by TM for the string aabbcc. (10 Marks)

OR

- 8 a. Explain with a neat diagram the working of TM and design a TM to accept all set of palidrom over $\{0,1\}^*$. Also show the transition diagram and instantaneous description on string "10101". (14 Marks)
- b. Discuss the relationship between the deterministic context free language and the languages that are not inherently ambigus. (06 Marks)

Module-5

- 9 a. With a neat diagram, explain variants of Turing Machines. (10 Marks)
- b. Explain with example,
 (i) Decidability (ii) Decidable languages (iii) Undecidable language. (10 Marks)

OR

- 10 a. Discuss Halting problem and post correspondence problem with respect to TM. (10 Marks)
- b. Define non-deterministic TM and prove that there in a deterministic TM 'M' such that, $T(M) = T(M_1)$. (10 Marks)

CBCS SCHEME

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17CS552

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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. Determine the following with on example.
i) Error ii) Fault iii) Failure iv) Incident (10 Marks)
b. Explain White Box Testing and Black Box Testing. Mention their advantages and disadvantages. (10 Marks)

OR

- 2 a. Explain the static and dynamic attributes in software quality. (10 Marks)
b. With a neat diagram, explain the levels of testing. (10 Marks)

Module-2

- 3 a. Explain the following equivalence testing types :
i) Weak Normal ii) Strong Normal iii) Weak Robust iv) Strong Robust. (10 Marks)
b. Design Decision Table for the triangle problem and explain the test cases. (10 Marks)

OR

- 4 a. Write a pseudocode for the commission problem. (10 Marks)
b. Justify the usage of boundary value analysis with an example and also mention its limitations? (10 Marks)

Module-3

- 5 a. Explain test coverage metrics. (10 Marks)
b. Explain du-path test coverage matrices with a data flow diagram. (05 Marks)
c. Explain McCabe's basic path method. (05 Marks)

OR

- 6 a. Define Slice based testing and explain the style and techniques of data flow testing. (10 Marks)
b. Write a triangle program. Draw the program graph and find the DD paths, DD path graph (10 Marks)

Module-4

- 7 a. Define scaffolding. Explain Generic versus specific scaffolding. (10 Marks)
b. Define Test Oracle. Explain with a neat diagram the concept of test harness. (10 Marks)

OR

- 8 a. Explain the following: i) Risk Planning ii) Process Monitoring. (10 Marks)
b. Describe the two main steps of orthogonal defect classification. (10 Marks)

Module-5

- 9 a. What is system Acceptance and Regressing Testing? Explain briefly. (10 Marks)
b. Write context diagram and Level.1 dataflow diagram of SATM system. (10 Marks)

OR

- 10 a. Define: i) Module execution path ii) Message iii) MM Path iv) MM – Path graphs. (04 Marks)
b. With an example, define the following:
i) Top Down Integration ii) Bottom up Integration iii) Sandwich Integration. (06 Marks)
c. Describe the Pairwise and Neighborhood Integration with examples. (10 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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. What are Enumerations? Explain values() and valueOf() methods with an example program. (05 Marks)
- b. What is Autoboxing? Write a java program that demonstrates how autoboxing and unboxing takes place in expression evaluation. (05 Marks)
- c. What are Annotations? Explain the following Built-in annotations with an example program:
@Override @Inherited @Retention (10 Marks)

OR

- 2 a. Explain the following methods of java.lang.Enum with an example program.
(i) ordinal() (ii) compareTo() (iii) equals() (10 Marks)
- b. Explain how to obtain Annotations at Run Time by use of Reflection. (10 Marks)

Module-2

- 3 a. What is collection framework? Explain the methods defined by collection interface. (10 Marks)
- b. Explain the constructors of HashSet class with an example program. (10 Marks)

OR

- 4 a. Explain the constructors of TreeSet class and write java program to create TreeSet collection. (10 Marks)
- b. Explain any four legacy classes of Java's collection framework. (10 Marks)

Module-3

- 5 a. What is string in Java? Write a java program that demonstrates any four constructors of String class. (10 Marks)
- b. Differentiate between equals() and == with respect to String comparison. (05 Marks)
- c. Explain any two character extraction methods of String class. (05 Marks)

OR

- 6 a. Explain any four String modification methods of String class. (10 Marks)
- b. Explain the following methods of StringBuffer class:
(i) append() (ii) insert() (iii) reverse() (iv) replace (10 Marks)

Module-4

- 7 a. Explain the differences between Servlets and CGI programs. (05 Marks)
- b. Write a Java Servlet program that demonstrates how parameters can be accessed from HTML. (10 Marks)
- c. Explain any two Cookies methods. (05 Marks)

OR

- 8 a. Define JSP. Explain different types of JSP tags by taking suitable example. (10 Marks)
b. List and explain core classes and interfaces in javax.servlet package. (10 Marks)

Module-5

- 9 a. Explain the four types of JDBC drivers. (10 Marks)
b. Describe the various steps of JDBC with code snippets. (10 Marks)

OR

- 10 a. Write a Java program to execute a database transaction. (10 Marks)
b. Explain :
(i) Callable Statement Object
(ii) Prepared Statement Object. (10 Marks)

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17CS562

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

Artificial Intelligence

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the components and categories of production system. List the requirement of good control strategies. (10 Marks)
- b. Explain steepest Hill climbing technique with an algorithm. Comment on its drawbacks and how to overcome these drawbacks. (10 Marks)

OR

- 2 a. Consider trying to solve the 8-puzzle instance given below using Hill climbing. Apply any heuristic function appropriate to solve the problem. (10 Marks)

Start state			End state		
2	8	3	1	2	3
1		4	8		4
7	6	5	7	6	5

- b. List and explain the problem characteristics which must be analyzed before deciding on a proper heuristic search. (10 Marks)

Module-2

- 3 a. Consider the following sentences:
- John likes all kinds of food.
 - Apples are food.
 - Anything anyone eats and isn't killed by is food.
 - Bill eats peanuts and is still alive.
 - Sue eats everything Bill eats.
- (i) Translate all the sentences into formulas in predicate logic. (12 Marks)
- (ii) Convert formulas from previous step into clause form.
- (iii) Prove that John likes peanuts using resolution. (12 Marks)
- b. Differentiate between forward and backward reasoning and list the factors that influences the choice between them. (08 Marks)

OR

- 4 a. Define CNF. Give an algorithm for converting given propositions to CNF. (10 Marks)
- b. Explain the different approaches used for knowledge representation and list the qualities a good knowledge representation system should possess. (10 Marks)

Module-3

- 5 a. Explain Justification based Truth Maintenance System (JTMS). What are the two critical criterion that must be met during labeling of JTMS and illustrate with suitable example. (10 Marks)
- b. What are portioned semantic nets? Express the following quantified expression using semantic nets:
- (i) Every dog has bitten a mail carrier.
- (ii) Every dog in town has bitten the constable. (10 Marks)

1 of 2

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OR

- 6 a. What are the key issues in non-monotonic reasoning system? Explain the two approaches used for logic representation for non-monotonic reasoning. (10 Marks)
b. Define Bayes theorem. What are its limitations? How certainty factor is used to overcome its limitation? (10 Marks)

Module-4

- 7 a. Explain the conceptual dependency representation of an event or action. (10 Marks)
b. Explain MINMAX search with appropriate algorithm. (10 Marks)

OR

- 8 a. What is global ontology? What are the distinctions provided by Global ontology for defining a 'thing'? (10 Marks)
b. What are scripts? Explain the important components of a script with an example. (10 Marks)

Module-5

- 9 a. Explain the usage of Soundex Algorithm for phonetic based spell checking with suitable example. (10 Marks)
b. Write a note on knowledge acquisition. (10 Marks)

OR

- 10 a. List and explain the steps involved in natural language processing. (10 Marks)
b. What is Analogy based learning? Differentiate between transformations analogy and derivational analogy. (10 Marks)

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17CS564

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Dot Net Framework for Application Development

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain namespaces with programming example. (05 Marks)
- b. Define variable. Explain the details of variable like declaration, initialization, accepting the value and also rules for it. Give simple examples. (07 Marks)
- c. Explain the method with syntax. Write a C# program for method overloading and also give explanation for overloading. (08 Marks)

OR

- 2 a. Write a C# program for factorial of a given number using while and for loop. (06 Marks)
- b. Explain conditional logical operators and write C# program for the same. (06 Marks)
- c. Describe the try, catch, finally and throw keywords with a programming example. (08 Marks)

Module-2

- 3 a. Define constructors. Explain constructor overloading with programming example. (06 Marks)
- b. Describe the Static class, Static method and data with an example. (06 Marks)
- c. Explain value type and reference type and boxing and unboxing with programming example. (08 Marks)

OR

- 4 a. Briefly explain “ref” and “out” keywords with examples. (05 Marks)
- b. Define enumerations with syntax. Write C# program that display month name and its numeric value using enum. (07 Marks)
- c. Describe the structures and jagged arrays with examples. (08 Marks)

Module-3

- 5 a. Explain the concept of params array with programming example. (06 Marks)
- b. Define inheritance. Explain new methods virtual methods and override methods with examples in inheritance. (08 Marks)
- c. Explain the use of extension methods in C# with programming example. (06 Marks)

OR

- 6 a. Define interface. Demonstrate implementation of an interface with programming example. (06 Marks)
- b. Explain abstract class and abstract method, with syntax and programming example. (06 Marks)
- c. Explain the garbage collector along with working procedure. And also explain the managing system resources by garbage collector. (08 Marks)

1 of 2

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Module-4

- 7 a. Describe the implementation of encapsulation by using methods and properties in a class with programming example. (08 Marks)
- b. List and explain the properly restrictions in C# encapsulation. (05 Marks)
- c. Define indexer. Demonstrate the use of indexers in C# with programming example. (07 Marks)

OR

- 8 a. Define Generic. Write a C# program for swapping of two numbers using generic method. (06 Marks)
- b. Define binary tree. Build a binary class by using generics. (05 Marks)
- c. Define collection class. List different collection classes and explain any one in detail. (09 Marks)

Module-5

- 9 a. Explain implementation of an enumerator by using iterator. (06 Marks)
- b. Define delegate. Explain the use of delegate in C# with an programming example. (06 Marks)
- c. Explain declaring, subscribing, unsubscribing and raising with respect to an event. (08 Marks)

OR

- 10 a. Define LINQ. Explain LINQ to selecting, filtering and ordering data with an example. (10 Marks)
- b. Explain operator overloading constraints. Write a C# program for operator + overloading. (10 Marks)

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Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Cryptography, Network Security and Cyber Laws

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 cyber attack? List and explain main motives of launching cyber attacks. (08 Marks)
- b. Using Extended Euclidean algorithm find the inverse of 12 modulo 79. (08 Marks)

OR

- 2 a. Design known plain test attack to obtain the key used in the Vigenere cipher. (08 Marks)
- b. Consider a Hill cipher $m = 3$ (block size = 3) with key k shown below:

$$k = \begin{pmatrix} 25 & 3 & 7 \\ 5 & 9 & 21 \\ 11 & 8 & 13 \end{pmatrix}$$

- (i) What is the cipher text corresponding to the plaintext = (VOW)?
- (ii) What is the plain text corresponding to the ciphertext = (TQX)? (08 Marks)

Module-2

- 3 a. List and explain RSA operations. (08 Marks)
- b. The modulus in a toy implementation of RSA is 143
- (i) What is the smallest value of a valid encryption key and the corresponding decryption key?
- (ii) For the computed encryption key and plaintext = 127, what is the corresponding ciphertext? (08 Marks)

OR

- 4 a. In what way are the properties of the cryptographic hash – the one way property and collision resistance relevant to the security provided by the MAC? Explain. (08 Marks)
- b. Consider the digital signature created using the Signer's private key operation but without the hash function i.e., $\text{sign}(m) = E_{\Lambda, \text{pr}}(m)$
Demonstrate how a forged signature may be created using this definition of a digital signature. (08 Marks)

Module-3

- 5 a. What do you mean key management? Explain the fields of an X.509 certificate. (06 Marks)
- b. List and explain PKI Architectures. (06 Marks)
- c. Define Dictionary Attacks. Explain Attack types. (04 Marks)

OR

- 6 a. Design the Needham – Schroeder protocol. (06 Marks)
- b. Define Kerberos. Explain Kerberos message sequence. (05 Marks)
- c. Explain SSL Record Layer Protocol. (05 Marks)

Module-4

- 7 a. Explain how each key in 802.11i was derived and where it is used. (06 Marks)
b. Define Firewall. List and explain main functions of a firewall. (06 Marks)
c. Classify Intrusion Detection Systems based on their functionality. (04 Marks)

OR

- 8 a. What is the role of a Bloom Filter in packet logging? (04 Marks)
b. Define SOAP. Explain SOAP messages in HTTP packets. (08 Marks)
c. Demonstrate WS-Trust relationship between entities involved in international trade. (04 Marks)

Module-5

- 9 a. List and explain IT act aim and objectives. (04 Marks)
b. Explain (i) Secure electronic record (ii) Secure digital signature (04 Marks)
c. List and explain Functions of a controller. (08 Marks)

OR

- 10 a. List and explain offences with reference to computer system. (06 Marks)
b. When network service providers not to be liable under IT Act? Explain. (04 Marks)
c. What are miscellaneous provisions of IT Act? Explain. (06 Marks)

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15CS62

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Describe various applications of computer graphics with appropriate examples. (08 Marks)
b. With a neat diagram, explain the architecture of a raster display system with integrated display processor. (08 Marks)

OR

- 2 a. With necessary steps explain Bresenham's line drawing algorithm. Consider the line from (5, 5) to (13, 9), use the Bresenham's algorithm to rasterize the line. (08 Marks)
b. Explain with diagram the different Cartesian reference frames are used in the process of constructing and displaying a scene. (08 Marks)

Module-2

- 3 a. Explain with example any two algorithms used for to identify the interior area of a polygon. (06 Marks)
b. Explain with illustrations the basic 2-dimension geometric transformations used in computer graphics. (06 Marks)
c. Explain the different Open GL routines used for manipulating display window. (04 Marks)

OR

- 4 a. Explain the scan line polygon filling algorithm. And also explain the use of sorted edge table and active edge list. (08 Marks)
b. What is the need of homogeneous coordinates? Give 2-dimension homogeneous coordinate matrix for translation, rotation and scaling. (04 Marks)
c. Obtain a matrix representation for rotation of a object about a specified pivot point in 2-dimension. (04 Marks)

Module-3

- 5 a. What is clipping? Explain with example the Sutherland-Hodgman polygon clipping algorithm. (08 Marks)
b. Explain basic illumination models. (08 Marks)

OR

- 6 a. Explain RGB and CMY color models with examples. Explain the transformation between CMY and RGB color spaces. (08 Marks)
b. Obtain the matrix representation for rotation of a object about an arbitrary axis. (08 Marks)

Module-4

- 7 a. Explain the 2 classifications of visible surface detection algorithm. (04 Marks)
b. Explain with example the depth buffer algorithm used for visible surface detection. And also list the advantages and disadvantages of depth buffer algorithm. (07 Marks)
c. Bring out the differences between perspective and parallel projections. (05 Marks)

OR

- 8 a. Explain the OpenGL 3-dimensional viewing functions. (06 Marks)
b. What is projection reference point? Obtain the general and special case perspective transformation equations. (06 Marks)
c. Explain Back-face detection method with example. (04 Marks)

Module-5

- 9 a. Explain the logical classifications of input devices with examples. (06 Marks)
b. Discuss request mode, sample mode and event mode with figures. (06 Marks)
c. List the various features that a good interactive program should include. (04 Marks)

OR

- 10 a. Explain how an event driven input can be performed for a keyboard and mouse device. (06 Marks)
b. List the properties of Bezier curve. And also explain Bazier techniques of generating curves. (10 Marks)

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CBCS SCHEME

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15CS63

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the various instruction formats used in SIC/XE machine. (04 Marks)
b. Write a SIC/XE program to copy the string "COMPUTER SCIENCE ENGINEERING" from STR1 to another string STR2. (06 Marks)
c. List the functions of Pass-1 and Pass-2 of a two pass assembler. (06 Marks)

OR

- 2 a. Write an algorithm of the Pass-1 of a two pass assembler. (08 Marks)
b. List the various machine independent assembler features. Explain the control-sections, how the assembler converter them into object code. (08 Marks)

Module-2

- 3 a. Define Macro. Explain how Macros are defined and expanded. (07 Marks)
b. What are the basic functions of a loader? Explain two ways of program relocation in loaders. (09 Marks)

OR

- 4 a. Explain the functions of dynamic linking with a diagram. (08 Marks)
b. Write a note on MS-DOS linker. (08 Marks)

Module-3

- 5 a. Explain the different phases of a compiler, with an example. (09 Marks)
b. What is input buffering in lexical analysis? List the different methods of input buffering explain any one of them. (07 Marks)

OR

- 6 a. List and explain the reasons for separating the analysis portion of a compiler into lexical and syntax analysis phases. (06 Marks)
b. Construct the transition diagram to recognize the tokens of
i) Identifier ii) Relational operators iii) Unsigned numbers. (06 Marks)
c. Define Tokens, patterns, lexemes. (04 Marks)

Module-4

- 7 a. What is the role of parser? Explain the different error recovery strategies. (08 Marks)
b. Construct the LL(1) parsing table for the following productions:
 $E \rightarrow E + T/T$; $T \rightarrow T * F/F$; $F \rightarrow (E)/id$ (08 Marks)

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

OR

- 8 a. Using operator-precedence parsing algorithm, construct the table and parse the input string $id + id * id$. (12 Marks)
b. Define Handle, viable prefixes. (04 Marks)

Module-5

- 9 a. Discuss S-attributed and L-attributed SDD. (06 Marks)
b. Write 3-address code syntax tree and DAG for the expression $a + a * (b - c) + (b - c) * d$. (10 Marks)

OR

- 10 a. Obtain the SDD and construct annotated parse tree for the input string $6 * 5 + 3$, for the grammar
 $S \rightarrow EN$
 $E \rightarrow E + T/T$
 $T \rightarrow T * F/F$
 $F \rightarrow (E)/\text{digit}$
 $N \rightarrow ;$ (10 Marks)
b. Discuss the issues in the design of code generator. (06 Marks)

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Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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 salient features of python. (05 Marks)
b. Write a python program to calculate the area of square, rectangle and circle. Print the results. Take input from user. (05 Marks)
c. What are user defined functions? How can we pass parameters in user defined functions? Explain with suitable example. (06 Marks)

OR

- 2 a. Explain the concept of conditional execution alternate execution and chained conditions with suitable examples. (06 Marks)
b. Write a python program to create a user defined function to find maximum and minimum letter in string. Also find the length the string without using inbuilt function. (05 Marks)
c. Explain the concept of type conversion functions and math functions in python with examples. (05 Marks)

Module-2

- 3 a. Explain the working of while loop in python with suitable example. (05 Marks)
b. Write a python program to demonstrate counting, summing and average of elements using loops. (05 Marks)
c. What is a string? Write a python program to demonstrate traversal through a string with a loop. Also explain the concept of string slicing. (06 Marks)

OR

- 4 a. With syntax and example code, explain the working of definite loop in python. (05 Marks)
b. Write a python program to concatenate and compare two strings. Read the strings from user. (05 Marks)
c. Explain fileopen, fileclose, fileread and filewrite concepts in python with example. (06 Marks)

Module-3

- 5 a. What is a list? Explain the concept of list slicing and list traversing with example. (05 Marks)
b. Explain the concept of comparing tuples. Describe the working of sort function with python code. (06 Marks)
c. Write a python program to search for lines that start with 'F' followed by 2 characters, followed by 'm:'. (05 Marks)

OR

- 6 a. What is dictionary? How is it different from list? Write a python program to count occurrence of characters in a string and print the count. (06 Marks)
b. With an example program, illustrate how to pass function arguments to list. (05 Marks)
c. Write a python program to search lines that start with 'X' followed by any non whitespace characters, followed by ':' ending with number. Display the sum of all these number. (05 Marks)

Module-4

- 7 a. Define class and object? What are programmer defined types? Explain with example. (05 Marks)
- b. Illustrate the concept of pure function with python code. (05 Marks)
- c. What is the difference between method and function? Explain the working of init method with suitable code. (06 Marks)

OR

- 8 a. Define attribute? With the help of python code, explain how functions return instance values. (06 Marks)
- b. Explain the concept of modifier with python code. (05 Marks)
- c. What is type based dispatch? Illustrate with python example. (05 Marks)

Module-5

- 9 a. Define socket? Write a python program that makes a connection to a webserver and follows the rules of HTTP protocol to request a plain text document and display what server sends back. (06 Marks)
- b. What is XML? How is it used in python? Explain parsing of XML with example. (05 Marks)
- c. Define cursor? Explain connect, execute and close command of databases with suitable example. (05 Marks)

OR

- 10 a. Write a python code to read the file from web using urelib and retrieve the data of the file. Also compute the frequency of each word in the file. (06 Marks)
- b. What is JSON? Illustrate the concept of parsing JSON python code. (05 Marks)
- c. Explain the concept of using JOIN to retrieve data in python. (05 Marks)

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Fifth Semester B.E. Degree Examination, Aug./Sept.2020 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. Compare client-server and peer-to-peer architecture. (06 Marks)
b. What are the different types of transport services provided by the internet? (08 Marks)
c. With a general format, explain the HTTP Request and HTTP Response messages. (06 Marks)

OR

- 2 a. Explain FTP commands and replies. (08 Marks)
b. What are the services provided by DNS? (04 Marks)
c. Write a short note on :
i) Web caching
ii) SMTP. (08 Marks)

Module-2

- 3 a. Explain UDP segment structure. (06 Marks)
b. With the help of FSM, describe the sender side and receiver side of rdt 2.0. (08 Marks)
c. Explain Selective Repeat Protocol. (06 Marks)

OR

- 4 a. With a neat diagram, explain TCP segment structure and its fields. (08 Marks)
b. Explain the way handshake and closing a TCP connection. (08 Marks)
c. Define the following :
i) Multiplexing
ii) Demultiplexing
iii) TCP
iv) UDP. (04 Marks)

Module-3

- 5 a. List and explain three switching techniques with a neat diagram. (10 Marks)
b. With the help of FSM, describe the sender side and receiver side of rdt 2.0. (10 Marks)

OR

- 6 a. Write the algorithm for the following :
i) Link-state
ii) Distance vector. (08 Marks)
b. Write a short note on :
i) Broadcast routing
ii) Multicast routing. (12 Marks)

Module-4

- 7 a. Explain 3G system architecture. (08 Marks)
b. Explain the two different routing approaches to mobile node. (12 Marks)

OR

- 8 a. Define handoff. List the steps involved when a base station does decide to handoff a mobile user. (10 Marks)
b. Write a short note on :
i) Agent discovery in mobile IP
ii) Registration with the home agent in mobile IP. (10 Marks)

Module-5

- 9 a. List and explain the types of multimedia networking application. (10 Marks)
b. Briefly explain the following :
i) RTP
ii) SIP. (10 Marks)

OR

- 10 Write a short note on:
a. FIFO scheduling mechanism
b. Priority queueing scheduling mechanism
c. Round robin and weighted fair queueing scheduling mechanism. (20 Marks)

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CBCS SCHEME

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17CS53

Fifth Semester B.E. Degree Examination, Aug./Sept.2020 Data Base Management Systems

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With a neat diagram, explain the components modules of DBMS and their interactions. (08 Marks)
- b. Explain the main characteristics of the database approach versus the file processing approach. (08 Marks)
- c. Define the following with example :
i) Value set ii) Data model iii) Metadata iv) Database. (04 Marks)

OR

- 2 a. List the advantages and disadvantages of DBMS. Discuss any five advantages by comparing with file system. (08 Marks)
- b. What are the structural constraints on a relationship type? Explain with an example. (06 Marks)
- c. Write a short note on Specialization and Generalization, with an example for each. (06 Marks)

Module-2

- 3 a. Consider the following schema and write the relational algebra :
Sailors (SID , Sname , Rating , Age)
BOATS (BID , Bname , Color)
RESERVE (SID , BID , Day)
i) Retrieve the sailors name who have reserved red and green boats.
ii) Retrieve the sailors name with age over 20 years and reserved black boat.
iii) Retrieve the sailors name who have reserved green boat on Monday.
iv) Retrieve the number of boats which are not reserved.
v) Retrieve the sailors names who is the oldest sailor with rating 10. (10 Marks)
- b. List Set theory operations, used in relational data model. Explain any two with an example. (06 Marks)
- c. Define the followings :
i) Relation state ii) Domain iii) Relation schema iv) Arity. (04 Marks)

OR

- 4 a. Discuss the various types of JOIN operations with an example. Why is THETA join required? (06 Marks)
- b. Describe the steps of an algorithm for ER – to – Relational mapping. (10 Marks)
- c. Describe any two characteristics of relations with suitable example for each. (04 Marks)

Module-3

- 5 a. How is view created and dropped? What problems are associated with updating views? (08 Marks)
- b. Consider the schema for COMPANY database :
EMPLOYEE (SSN, Name, Address, Sex, Salary, SuperSSN, DNo)
DEPARTMENT (DNo, Dname, MgrSSN, MgrStartDate)
DLOCATION (DNo, DLoc)
PROJECT (PNo, PName, PLocation, DNo)
WORK_ON (SSN, PNo , Hours)

1 of 2

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

Write the SQL queries to :

- i) Make a list of all project numbers for projects that involve as employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.
- ii) Show the resulting salaries if every employee working on the 'IOT' project is given a 10% raise.
- iii) Find the sum of salaries of all Employees of the 'accounts' departments as well as the maximum salary, the minimum salary and the average salary in this department.
- iv) Retrieve the name of each Employee who works on all the projects controlled by department number 5 (Use NOT EXISTS Operator).
- v) For each department that has more than five employees, retrieve the department number and the number of its Employee who are making more than Rs 6,00,000. (12 Marks)

OR

- 6 a. Define Stored Procedure. Explain the creating and calling of stored procedure with suitable example. (08 Marks)
- b. Explain three – tier architecture, with a neat diagram. (04 Marks)
- c. Consider the schema for STUDENT database.
STUDENTS (SID, Sname, Major , GPA)
FACULTY (FID, Fname, Dept, Designation, Salary)
COURSE (CID, Cname, FID)
ENROL (CID, SID, GRADE)
Write the following query in SQL :
 - 1) Give a 15% raise to salary of all faculty.
 - 2) List all the departments having an average salary of above Rs 20,000.
 - 3) List the names of all faculty members beginning with 'R' and ending with letter "U".
 - 4) List the names of students enrolled for the course 'GS – 53' and have received 'A' grade. (08 Marks)

Module-4

- 7 a. Explain informal design guidelines for relation schemes. (06 Marks)
- b. What is the need for normalization? Explain 1st, 2nd, 3rd normal forms, with an examples. (14 Marks)

OR

- 8 a. Find the minimal cover of F.D.
 $E : \{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$. (06 Marks)
- b. Consider $R(A, B, C, D)$ with $FD = \{A \rightarrow B, B \rightarrow C, C \rightarrow D\}$.
 - i) Find the key
 - ii) Indicate the highest normal form and convert the relation into BCNF. (08 Marks)
- c. Write an algorithm to find the closure of 'X' and 'F'. (06 Marks)

Module-5

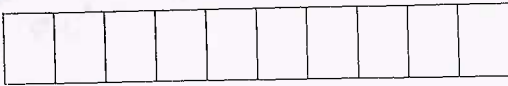
- 9 a. Explain the desirable properties of a transactions. (08 Marks)
- b. Explain with a neat diagram, the state transition diagram for a transaction. (08 Marks)
- c. What is two phase locking? Describe with the help of an example. (04 Marks)

OR

- 10 a. Why concurrency control is needed demonstrate with example? (10 Marks)
- b. When deadlock and starvation problems occurs? Explain how these problems can be resolved? (10 Marks)

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2 of 2



Fifth Semester B.E. Degree Examination, Aug./Sept. 2020 Automata Theory & 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 DFA. What are the differences between DFA and NFA? (06 Marks)
- b. Construct the DFA for the following languages over $\Sigma = \{a, b\}$:
 - (i) Set of all strings ending with a and b. (09 Marks)
 - (ii) Set of all strings not containing the substring "aab".
 - (iii) Set of all strings with exactly three consecutive a's. (09 Marks)
- c. Construct the NFA model for the following language:

$L = \{\omega \in \{a, b\}^* : \omega = aba \text{ or } |\omega| \text{ is even}\}$ (05 Marks)

$L = \{\omega : \text{there is a symbol } a_i \in \Sigma \text{ not appearing in } \omega\}$ where $\Sigma = \{a, b, c, d\}$ (05 Marks)

OR

- 2 a. Convert the following ϵ -NFA to DFA. (Ref. Fig. Q2 (a)). (08 Marks)

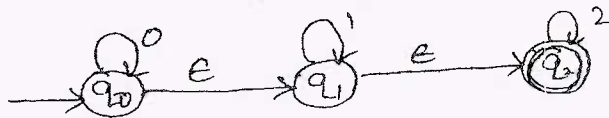


Fig. Q2 (a)

- b. Minimize the following automata: (Ref. Fig. Q2 (b)) (08 Marks)

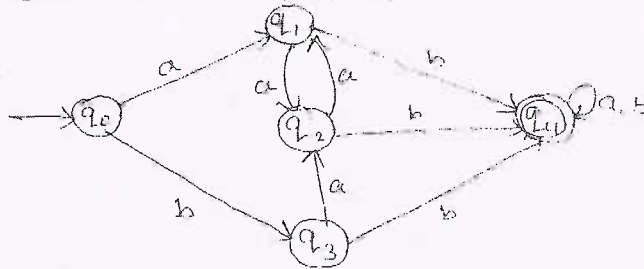


Fig. Q2 (b)

- c. Different between Mealy machine and Moore machine with example. (04 Marks)

Module-2

- 3 a. Define Regular expression. Convert the following automation to a regular expression. (08 Marks)

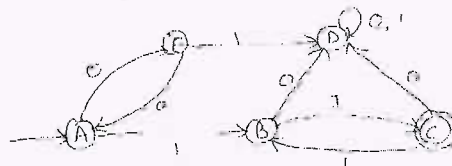


Fig. Q3 (a)

- b. Construct the NFA for the following regular expression $\frac{(0+1)^*}{(0+1)}$ (04 Marks)
- c. State and prove the pumping lemma for regular languages. (08 Marks)

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

OR

- 4 a. Show that $L = \{0^n \mid n \text{ is prime}\}$ is not regular? (06 Marks)
- b. State and prove that regular languages are closed under complement, intersection difference, reverse and letter substitution. (08 Marks)
- c. Write the regular expression for the following languages:
 $L = \{a^n b^m \mid m + n \text{ is even}\}$
 $L = \{a^n b^m \mid m > 1, n \geq 1, nm \geq 3\}$ (06 Marks)

Module-3

- 5 a. Define Regular Grammar? Write CFG for the following languages:
 $L = \{0^n 1^n \mid n \geq 1\}$
 $L = \{ \text{strings of a's and b's with equal no. of a's and b's} \}$ (05 Marks)
- b. Define ambiguous grammar and show that following expression grammar is ambiguous over the string $id + id * id$. Write equivalent unambiguous grammar for the same?
 Grammar
 $E \rightarrow E + E$
 $E \rightarrow E - E$
 $E \rightarrow E * E$
 $E \rightarrow E / E$
 $E \rightarrow id$ (05 Marks)
- c. Define PDA. Obtain a PDA to accept the following language:
 $L = \{n_a(\omega) = n_b(\omega) \text{ where } n \geq 1\}$
 Draw the transition diagram for PDA. Also show the moves made by the PDA for the string "aabbab". (10 Marks)

OR

- 6 a. Obtain the following grammar in CNF
 $S \rightarrow ABC$
 $A \rightarrow aC / D$
 $B \rightarrow bB / E / A$
 $C \rightarrow Ac / E / Cc$
 $D \rightarrow aa$ (10 Marks)
- b. Define inherently ambiguous language with example. (04 Marks)
- c. Let G be the grammar.
 $S \rightarrow aB / bA$
 $A \rightarrow a / aS / bAA$
 $B \rightarrow b / bS / aBB$
 For the string aaabbabbba find
 (i) Left most derivation.
 (ii) Right most derivation.
 (iii) Parse tree. (06 Marks)

Module-4

- 7 a. State and prove the pumping theorem for Context Free Languages.
 Show that $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free. (12 Marks)
- b. Define Turing machine and explain with neat diagram, the working of a basic turing machine. (08 Marks)

OR

- 8 a. Design a TM to accept $\{0^n 1^n 2^n \mid n \geq 1\}$ and show the moves made by the machine for the string 000111222? (10 Marks)
- b. Describe in detail decidable languages. (05 Marks)
- c. Briefly explain the technique for Turing machine construction? (05 Marks)

Module-5

- 9 a. Explain the following:
- (i) Non deterministic Turing Machine.
 - (ii) Multitape Turing Machine. (10 Marks)
- b. Discuss the following:
- (i) Recursively enumerable language.
 - (ii) Post correspondence problem. (10 Marks)

OR

- 10 Write short note on the following:
- a. Quantum computer.
 - b. Class NP.
 - c. Church Turing Thesis.
 - d. Model of linear bounded automation.
 - e. Halting problem of Turing Machine. (20 Marks)

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Fifth Semester B.E. Degree Examination, Aug./Sept. 2020 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. Define Error, fault, failure, Incident, Test and Test case. Explain testing life cycle with a neat diagram. (10 Marks)
b. Explain Functional Testing and Structural Testing. (10 Marks)

OR

- 2 a. With a neat diagram, explain testing and debugging cycle. (10 Marks)
b. Explain the classification of test metrics used in software testing. (10 Marks)

Module-2

- 3 a. Write a Pseudocode for structured programming version of a triangle program. (10 Marks)
b. With a neat diagram, explain currency converter. (06 Marks)
c. Explain Saturn Windshield Wiper Controller. (04 Marks)

OR

- 4 a. Explain the following Equivalence class testing with respect to
i) Weak Normal
ii) Strong Normal
iii) Weak Robust
iv) Strong Robust. (10 Marks)
b. What are Decision Table? Explain the portions of a decision table. Write the decision table for the triangle program. (10 Marks)

Module-3

- 5 a. Explain fault-Based testing terminologies. (10 Marks)
b. Explain with respect to structural testing
i) Statement testing
ii) Branch testing. (10 Marks)

OR

- 6 a. Explain McCabe's Basis path method for a strongly connected graph. Write the Path/Edge traversal. (10 Marks)
b. Explain Definition-use Testing. (10 Marks)

Module-4

- 7 a. Explain the following with respect to test execution
i) Scaffolding
ii) Test Oracles. (10 Marks)
b. Explain the six basic principles of process framework. (10 Marks)

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

OR

- 8 a. Explain the following :
i) The quality process (10 Marks)
ii) Dependability properties. (10 Marks)
- b. List and explain risks in process and quality management. (10 Marks)

Module-5

- 9 a. Explain different integration testing strategies. (10 Marks)
- b. Explain :
i) Acceptance Testing
ii) System Testing. (10 Marks)

OR

- 10 a. Explain the upper-level SATM finite state machine. (10 Marks)
- b. Explain the path – Based Integration testing. (10 Marks)

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Fifth Semester B.E. Degree Examination, Aug./Sept. 2020 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. Compare and contrast auto boxing and unboxing in Java with an example. (06 Marks)
- b. Build a Java program to create an enumeration class of seasons and demonstrate usage of values () and valueOf () methods. (08 Marks)
- c. What is an Annotation? Explain various retention policies for annotation in Java. (06 Marks)

OR

- 2 a. Explain the following methods of java.lang.Enum with an example
 - i) Ordinal ()
 - ii) compareTo ()
 - iii) equals ()(06 Marks)
- b. What do you mean by Type Wrapper? Explain numeric type wrapper with an example. (06 Marks)
- c. Explain the following Built-in Annotations with a Java code i) Override ii) Inherited iii) Retention. (08 Marks)

Module-2

- 3 a. What is collection framework? Explain any four methods defined by the collection interface. (10 Marks)
- b. Define legacy class – vector with syntax declaration and demonstrate various vector operations. (06 Marks)
- c. Explain the constructors of TreeSet with example. (04 Marks)

OR

- 4 a. Create a class EMPLOYEE with two private string members: employee_id, employee_Name. Using LinkedList class, develop a Java program to add atleast 3 objects of above EMPLOYEE class and display the data in neat format. (08 Marks)
- b. Demonstrate ArrayList class for collection with an example. (06 Marks)
- c. Write the syntax declaration of Queue interface and explain any four methods defined by Queue. (06 Marks)

Module-3

- 5 a. Define String. Explain the different ways constructing string object. (06 Marks)
- b. Explain and make use of the following string handling methods to modify a string.
 - i) substring ()
 - ii) concat ()
 - iii) replace ()
 - iv) trim ()(08 Marks)
- c. Develop a Java program to count the occurrence of character in a given string. (06 Marks)

OR

- 6 a. Differentiate between string and string Buffer explain reverse () method of stringBuffer with an example. (08 Marks)
- b. Explain the following character extraction methods : i) charAt() ii) toCharArray(). (06 Marks)
- c. Explain insert () and append () stringBuffer methods with an example. (06 Marks)

Module-4

- 7 a. Explain the life cycle of a servlet. (04 Marks)
- b. Write a Java Servlet program to accept two parameters from webpage, find the sum of them and display the result in webpage. Also give necessary html script to create web page. (10 Marks)
- c. Explain how cookies can be handled using servlets. (06 Marks)

OR

- 8 a. Define JSP. Explain the different types of JSP tags by taking suitable example. (10 Marks)
- b. What are Cookies? How Cookies are handled in JSP? Write a program create with name "Username" and Cookie value "abc". Also display stored Cookie in webpage. (10 Marks)

Module-5

- 9 a. Explain the different step involved in JDBC process with a code snippet. (08 Marks)
- b. Explain the four types of JDBC drivers. (08 Marks)
- c. List and explain the three kinds of exceptions occurred in JDBC. (04 Marks)

OR

- 10 a. Write a program to connect to database with following information:
 Driver : JDBC/ODBC bridge
 URL : "jdbc:odbc:Ex"
 username " "xyz"
 password : "123"
 Retrieve all rows with marks > 60.
 Assume the following table :
 Table Name : STUDENT
 Fields : USN_Varchar (20), Marks_int, Name_Varchar (25)
 (10 Marks)
- b. Explain the different types of statement object with example. (06 Marks)
- c. Discuss the Scrollable Result set in JDBC. (04 Marks)

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17CS564

Fifth Semester B.E. Degree Examination, Aug./Sept.2020 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. List and discuss the issues which arises when namespace is not used. With example explain how it can be solved using namespace. (08 Marks)
- b. What is implicit variable? Explain with example how implicit variables are declared. (05 Marks)
- c. Write a C# program to find sum, difference, product and quotient of two input numbers using expression bodied method. In Main() method read 2 numbers from the users and print results on the screen after calling sum(), differences() product() and quoticut() method. (07 Marks)

OR

- 2 a. List and explain different binary operators available in C#. (07 Marks)
- b. Explain with example checked and unchecked statement. (04 Marks)
- c. Develop a C# program with method named DayName(int day), which accepts day number as parameter and returns day name {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday} as return value. Method throws an exception if day value is less than 1 and greater than 7. Program should also contain "Main()" method which displays day name on the screen. (09 Marks)

Module-2

- 3 a. Define encapsulation. Explain the purpose of encapsulation with an example. (05 Marks)
- b. What is a constructor? Explain the necessity of constructor. Write a program to demonstrate the constructor overloading. (10 Marks)
- c. Explain the differences between a structure and class with example. (05 Marks)

OR

- 4 a. Illustrate with the program how to control the accessibility of members by using the public and private keywords. (06 Marks)
- b. Explain with an example how to create a multidimensional array. Distinguish how jagged arrays are better than multidimensional arrays with example. (08 Marks)
- c. Illustrate with neat diagram what is boxing and unboxing. (06 Marks)

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

Module-3

- 5 a. Differentiate between optional parameters and params array. (04 Marks)
 b. Explain how to control method hiding and overriding by using the new, virtual and override keywords with example. (10 Marks)
 c. Demonstrate with an example program the concept of dynamic polymorphism. (06 Marks)

OR

- 6 a. Define interface list out the interface restriction. (05 Marks)
 b. Write a program with a class named 'Box' with data members length, breadth and height and a constructor to initialize data members, volume() method to calculate volume (length * breadth * height). Create another class called "BoxWeight" derived from "Box" class. "BoxWeight" class contains a data member weight and two method : constructor and DisplayWeight() to initialize and to display weight respectively. Last class named "Demo" should contain Main() method which creates object and display data on the screen. (10 Marks)
 c. List the steps followed by garbage collector to de-allocate unreachable objects. (05 Marks)

Module-4

- 7 a. Define properties. Explain how to create and use properties to provide controlled access to data in an object with example. (06 Marks)
 b. What are the problems with the object type? How can you solve these problems using generic class with example? (08 Marks)
 c. Explain how to create automatic properties. (06 Marks)

OR

- 8 a. Define an indexer. List and explain set of operators provided by a C# that can be used to access and manipulate bits in a int. (10 Marks)
 b. What is generic method? Implement a generic method which is independent of the type of data on which it operates to swap two data. In Main() method display the value of data before swapping and after swapping. Demonstrate program for 'char' and int type values. (10 Marks)

Module-5

- 9 a. Define a simple iterator. Explain how to define a simple enumerator that can be used to iterate over the elements in a collection. (08 Marks)
 b. Explain how to handle an event by using a delegate. (07 Marks)
 c. List the rules that operators implemented automatically fall into a well-defined framework in C#. (05 Marks)

OR

- 10 a. Define Language Integrated Query(LINQ) queries to examine contents of enumerable collection with example. (10 Marks)
 b. Write a C# program that adds and subtracts two instance of hours by overloading + and - binary operator framework in C#. (10 Marks)

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CBCS SCHEME

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15CS53

Fifth Semester B.E. Degree Examination, Aug./Sept.2020 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. Discuss the advantages of using the DBMS approach. (06 Marks)
- b. Explain three-schema architecture with a neat diagram. Why do we need mapping between schema levels? (06 Marks)
- c. What is Data Independent? Explain different types of Data Independence. (04 Marks)

OR

- 2 a. Explain the component modules of DBMS and their interaction with a neat diagram. (06 Marks)
- b. Explain different types of attributes that occur in ER model with an example. (06 Marks)
- c. Design a ER diagram for keeping track of information about Bank database taking into an account atleast four entities. (04 Marks)

Module-2

- 3 a. Discuss the characteristics of relations that make them different from ordinary tables and files. (08 Marks)
- b. Explain the steps to convert the basic ER model to relational database schema. (08 Marks)

OR

- 4 a. What are the basic data types available for attributes in SQL? Explain with example. (06 Marks)
- b. Define foreign key. Explain all possible options that can be specified when a referential integrity constraint is violated. (04 Marks)
- c. Write the SQL syntax with example for the following :
(i) ALTER (ii) INSERT (iii) UPDATE (06 Marks)

Module-3

- 5 a. Explain the following with an example.
(i) Correlated nested queries
(ii) Assertions. (06 Marks)
- b. Explain aggregate functions in SQL with example. (04 Marks)
- c. Consider the following tables:
WORKS(Pname, Cname, Salary)
LIVES(Pname, Street, City)
LOCATED_IN(Cname, City)
MANAGER(Pname, Mgrname)
Write the SQL Query for the following :
(i) Retrieve the names of the people who work for Wipro along with the address they live in.
(ii) Retrieve the name of the person who gets second highest salary.
(iii) Find the number of employee and average salary of each company. (06 Marks)

OR

- 6 a. Explain the following with an example:
 (i) Cursor
 (ii) Database Stored Procedure. (08 Marks)
- b. Explain the Standard Three-Tier Architecture and list the advantages. (08 Marks)

Module-4

- 7 a. What is Functional Dependency? Explain the inference rules for functional dependency with proof. (08 Marks)
- b. Define 1NF, 2NF and 3NF by taking an example. (08 Marks)

OR

- 8 a. Write an algorithm to find a minimal cover for a set of functional dependencies. (04 Marks)
- b. Find the closure sets with respect to F.
 $F = \{ssn \rightarrow \{Ename, Bdate, Address, Dnumber\}, Dnumber \rightarrow \{Dname, Dmgr_ssn\}\}$ (04 Marks)
- c. Which normal form is based on the concept of multivalued functional dependency? Explain the same with example. (08 Marks)

Module-5

- 9 a. What are the problems faced when concurrent transactions are executed in an uncontrolled manner? Give an example and explain. (06 Marks)
- b. With a neat diagram explain the states for transaction execution. (06 Marks)
- c. Briefly explain the desirable properties of transactions. (04 Marks)

OR

- 10 Write a note on :
 a. Timesamp ordering (08 Marks)
- b. NO-UNDO/REDO recovery algorithm. (08 Marks)

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CBCS SCHEME

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15CS/IS54

Fifth Semester B.E. Degree Examination, Aug./Sept. 2020 Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define the following with examples :
i) String ii) Language (04 Marks)
b. Explain various functions on languages. (02 Marks)
c. Draw the deterministic Finite State Machine for the following :
i) To accept decimal string divisible by 3 over the alphabet $\Sigma = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$
ii) To accept odd number of a's and even number of b's over alphabet. $\Sigma = \{a, b\}$ (10 Marks)

OR

- 2 a. Write an algorithm for deterministic FSM simulator. (04 Marks)
b. Convert the following Non – deterministic FSM to Deterministic FSM using subset construction method. (Ref. Fig Q2(b)) (08 Marks)

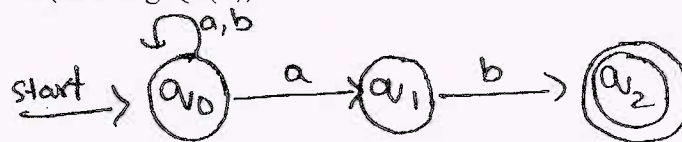


Fig Q2(b)

- c. Describe standard bar code reader and write its Finite State Machine diagram. (04 Marks)

Module-2

- 3 a. What is Regular expression? And mention the applications of regular expression. (03 Marks)
b. Find the regular expression for the following Languages :
i) To accept strings of 0's and 1's having no two consecutive 0's
ii) $L = \{a^m b^n \mid m \geq 1, n \geq 1, nm \geq 3\}$ (06 Marks)
c. Obtain a regular expression using Kleene's theorem for the finite automata shown below in Fig Q3(c) (07 Marks)

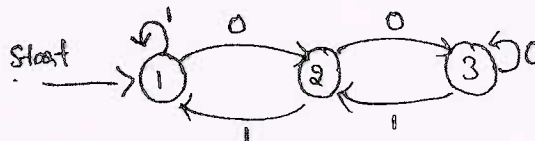


Fig Q3(c)

(07 Marks)

OR

- 4 a. State and prove pumping lemma theorem for Regular language. (07 Marks)
b. Prove that the regular languages are closed under complement, intersection, difference, reverse and letter substitution. (05 Marks)
c. State and prove : "The Regular languages are closure under union, concatenation and Kleene's Star". (04 Marks)

Module-3

- 5 a. Define Context – Free Grammar (CFG). Design CFG for the following language.
 i) To generate the strings of balanced parentheses
 ii) $L = \{0^m 1^m 2^n \mid m \geq 1 \text{ and } n \geq 0\}$ (08 Marks)
- b. What is ambiguous grammar? Show that the following grammar is ambiguous.
 $E \rightarrow E + E \mid E * E \mid (E) \mid id$
 Write the left most derivation for the string “id + (id * id)” (08 Marks)

OR

- 6 a. Define Deterministic PDA with example. (04 Marks)
 b. Obtain PDA to accept the language.
 $L = \{WCW^R \mid W \in (a + b)^*\}$ where W^R is reverse of W by a final state. (07 Marks)
 c. Convert the following CFG to an equivalent PDA.
 $S \rightarrow aABB \mid aAA$
 $A \rightarrow aBB \mid a$
 $B \rightarrow bBB \mid A$
 $C \rightarrow a$ (05 Marks)

Module-4

- 7 a. Prove that “The Context – Free Language properly contain the Regular languages”. (04 Marks)
 b. Show that the language $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free. (08 Marks)
 c. Prove that “Context – Free Language are non closure under intersection”. (04 Marks)

OR

- 8 a. Define Turing Machine. Explain the working of a Turing machine model. (06 Marks)
 b. Design a turning machine that accepts $L = \{0^n 1^n \mid n \geq 1\}$. Write the transition diagram for the same and also indicate the moves made by the turning machine for the input ‘0011’. (10 Marks)

Module-5

- 9 a. Write short notes on :
 i) Multitape Turing Machine
 ii) Model of Linear Bounded Automation. (10 Marks)
 b. Prove that “ $HALT_{TM} = \{(M, W) \mid \text{The Turing machine } M \text{ halts on input } W \text{ is undecidable}\}$ ”. (06 Marks)

OR

- 10 a. Prove that “The growth rate of any exponential functional is greater than that of any polynomial”. (08 Marks)
 b. Write short note on :
 i) Quantum Computers
 ii) Church Turning Thesis. (08 Marks)

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CBCS SCHEME

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15CS62

Sixth Semester B.E. Degree Examination, Aug./Sept.2020 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. List and explain any six application of computer graphics. (06 Marks)
b. Explain Refresh Cathod Ray Tube with diagram. (10 Marks)

OR

- 2 a. Develop Bresenham's line drawing algorithm. (05 Marks)
b. Write circle drawing algorithm. Given circle radius $r = 10$, solve the midpoint circle algorithm by determining positions along the circle octant in the first quadrant from $x = 0$ to $x = y$. (11 Marks)

Module-2

- 3 a. Classify the polygons and describe fill area primitives with diagrams. (08 Marks)
b. Describe about Inside-Outside Tests. (08 Marks)

OR

- 4 a. Explain General Scan Line Polygon fill algorithm. (08 Marks)
b. Describe any two of dimensional composite transformation
i) 2D translation ii) 2D fixed point scaling. (08 Marks)

Module-3

- 5 a. Describe 3D translation and scaling. (08 Marks)
b. Explain window to viewport transformation. (08 Marks)

OR

- 6 a. Discuss the Cohen Sutherland line clipping with program. (10 Marks)
b. Explain RGB color model. (06 Marks)

Module-4

- 7 a. Explain Orthogonal Projections. (10 Marks)
b. Discuss the OpenGL visibility Detection functions. (06 Marks)

OR

- 8 a. Explain the Perspective projections. (06 Marks)
b. Discuss the Depth buffer method. (10 Marks)

Module-5

- 9 a. Describe the Menus with program. (06 Marks)
b. What is the necessity of programming event driven input? Describe window events and keyboard event. (10 Marks)

OR

- 10 a. Explain Rotating square in Animating interactive programs. (07 Marks)
b. Write short notes on Bezier surfaces. (09 Marks)

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

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Sixth Semester B.E. Degree Examination, Aug./Sept. 2020 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 types of error with examples. (04 Marks)
b. Explain various Names, Keywords and expressions with examples. (06 Marks)
c. Write a python program using try and except, so that your program handles non-numeric input gracefully by printing a message and exiting the program the following shown two execution of the program
Enter Hours : 20
Enter Rate : nine
Error, please enter numeric input
Enter hours : forty
Error, please enter numeric input. (06 Marks)

OR

- 2 a. Explain conditional execution, Alternative execution chained conditionals and nested conditionals with examples. (08 Marks)
b. Explain break and continue statement with examples in python. (04 Marks)
c. Explain with an example what are fruitful functions and void functions. (04 Marks)

Module-2

- 3 a. Explain while and for loops with examples. (04 Marks)
b. Write a python program to find the largest value from the given set of accepted values. (06 Marks)
c. Discuss the string handling methods in python with examples. (06 Marks)

OR

- 4 a. Write a python program to check whether a given string is palindrome or not. (06 Marks)
b. Explain with example the syntax of read (), write () methods for a file. (04 Marks)
c. Develop a python program for creating a copy an existing file. (06 Marks)

Module-3

- 5 a. Explain the difference between a list and a dictionary. (04 Marks)
b. Make a list of first ten letters of the alphabet then using the slice operation do the following:
i) Print the first three letters from the list
ii) Print any three letters from the middle
iii) Print the letters from 5th letters to the end of the list. (04 Marks)
c. Discuss the lists handling functions in python with example. (08 Marks)

OR

- 6 a. Differentiate between list and dictionary. (08 Marks)
 b. Define tuple, explain DSU pattern. Write a python code to determinate tuples by sorting a list of words from longest to shortest using loops. (04 Marks)
 c. Explain the need of Regular expressions in python language. (04 Marks)

Module-4

- 7 a. Explain classes and attributes in python language with examples. (05 Marks)
 b. Explain pure functions and modifiers with examples. (05 Marks)
 c. Write a program that uses class to store the name and marks of students. Use list to store the marks in three subjects. (06 Marks)

OR

- 8 a. Explain initialization method with example. (04 Marks)
 b. Write a class Rectangle that has attributes length and breadth and a method area which returns the area of the rectangle. (06 Marks)
 c. What is operator overloading? Write python code to overload “ + ” “ - ” and “ * ” operator by providing the methods `__add__`, `__sub__` and `__mul__`. (06 Marks)

Module-5

- 9 a. Write a python code for retrieving the romeo.txt file from the web and compute the frequency of each word in the file. (06 Marks)
 b. Write a note on XML. (05 Marks)
 c. Explain with a neat diagram of Service Oriented Architecture. (05 Marks)

OR

- 10 a. Describe creation of database table using database cursor architecture. (08 Marks)
 b. Write a python code for creating employee database, inserting records and selecting the employees working in the company. (08 Marks)

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