

CBCS SCHEME

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17CS51

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

Time: 3 hrs.

Max. Marks: 100

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

Module-1

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

OR

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

Module-2

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

OR

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

Module-3

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

OR

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

Module-4

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

OR

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

Module-5

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

OR

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

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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17CS52

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

Computer Networks

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Many networks, including internet, provide more than one transport layer protocol. When you develop an application you need to choose one of the available transport layer protocol and consider various parameters. Explain the parameters and protocols to be considered while designing an application. (08 Marks)
- b. True or False :
- Processes on two different systems communicate with each other by exchanging messages across the computer networks
 - A client server architecture achieves perfect security
 - Socket is a hardware interface through which a process sends message into, and receives messages from the network
 - No data loss is tolerated in multimedia applications such as conversational audio/video
 - Developing a new network application for the internet often requires one to decide whether to choose UDP or TCP. (05 Marks)
- c. With a simple sketch, explain how SMTP operate when A send mail to B where mail server of A and B are different. Show the sequence of events. (07 Marks)

OR

- 2 a. HTTPRequest message
GET/somedir/page.html HTTP/1.1
HOST : www.someschool.edu
Connection : close
User_agent : Mozilla/5.0
Accept_language : fr
Interpret the meaning of each line in few sentences. (05 Marks)
- b. Explain meaning of each line of HTTPResponse message given below :
HTTP/1.1 200 ok
Connection : close
Date : Tue, 09 Aug 2011 15 : 44 : 04 GMT
Server : Apache/2.2.3
Last modified : Tue, 09 Aug 2011 15 : 11 : 03 GMT
Content_Length : 6821
Content_type : text/html
(data data - - - -). (07 Marks)
- c. What is the service provided by DNS system? Explain the meaning of root DNS server, Top Level Domain Servers (TLD), Authoritative DNS servers. Explain the meaning of the following DNS records
(relay1.bar.foo.com, 145.37.93.126, A)
(foo.com, mail.bar.foo.com, MX). (08 Marks)

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Module-2

- 3 a. State the assumptions in rdt 2.0 and explain the behavior of the stop-and-wait protocol. Draw the FSM of sender and receiver clearly showing the events and action. (10 Marks)
- b. Show the operation of GBN protocol of with a sketch. Window size is 4 packets. Show the sequence of sending six packets (pkt0-pkt5) where pkt0 and pkt1 are correctly received and packet (pkt2) 2 is lost. (10 Marks)

OR

- 4 a. With a diagram, explain the TCP segment structure write one line about each field. (07 Marks)
- b. Explain TCP connection management with appropriate sketches (three way handshake, closing). Explain use of SYN, FIN, RST. (07 Marks)
- c. Explain the flow control service provided by TCP with a simple sketches show the buffer variation and derive the formula for rwnd. Explain how the window information at receiver side is communicated to the sender. (06 Marks)

Module-3

- 5 a. Explain router architecture with a simple sketch. How packet queueing occur at router? (08 Marks)
- b. Compare the routing protocols RIP and OSPF. (04 Marks)
- c. With a diagram, explain each field in the IPV₄ datagram. Write only few sentences about each field. (08 Marks)

OR

- 6 a. Suppose a router receives an IP packet containing 4020 bytes and to be forwarded to an outgoing link with MTU(Maximum Transmission Unit) of 1500 bytes. Assume the IP header is 20 bytes. Show the fragments the router creates and specify relevant values for each fragment (ID, offset and flag) and bytes in each. (08 Marks)
- b. Draw the IPV₆ datagram format. Indicate two key differences between IPV₄ an IPV₆ format. (04 Marks)
- c. Refer the following network. Find the shortest path from node 'C' to all other nodes using link state algorithm.

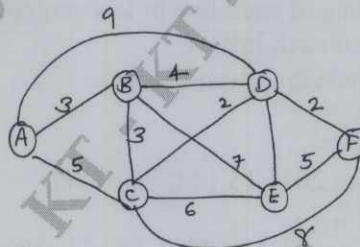


Fig.6(c)

(08 Marks)

Module-4

- 7 a. Explain the components in a cellular network. (10 Marks)
- b. Explain steps of hand off for a mobile users. (10 Marks)

OR

- 8 a. With a diagram explain two different types of routing approach to mobile node. (10 Marks)
- b. Explain agent discovery in mobile IP. Show the ICMP message and registration steps with home agent. (10 Marks)

Module-5

- 9 a. Explain the working of video streaming over HTTP. Explain perfecting, buffer etc and the roles in this process. (08 Marks)
- b. Explain how DASH helps to improve streaming over different available bandwidth. (03 Marks)
- c. Explain CDN operation with a simple sketch in a scenario a user try to get video from a site NetCinema. (09 Marks)

OR

- 10 a. Explain how classes of service (RoS) is achieved in network with a sketch showing two users, one is doing VOIP and the other browsing. Explain packet marking using IPV₄ header. (10 Marks)
- b. Explain how leaky bucket algorithm is used to achieve traffic policing. (10 Marks)

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17CS53

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

Database Management System

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Discuss the main characteristics of the database approach and how it differs from traditional file systems? (08 Marks)
- b. What are the different types of database end users? Discuss the main activities of each. (06 Marks)
- c. Describe the three schema architecture? (06 Marks)

OR

- 2 a. Design an ER diagram for company database with atleast four entities. (08 Marks)
- b. What is meant by Recursive relationship type? Give some example of recursive relationship type. (06 Marks)
- c. What is Generalization? Illustrate how it is helpful with an example. (06 Marks)

Module-2

- 3 a. Discuss the characteristics of relation that make them different from ordinary tables. (08 Marks)
- b. Discuss DIVISION operation. Find the quotient for the following : A/B_1 , A/B_2 and A/B_3 ; where A, B_1 , B_2 and B_3 are

A =

SNo.	PNo.
S ₁	P ₁
S ₁	P ₂
S ₁	P ₃
S ₁	P ₄
S ₂	P ₁
S ₂	P ₂
S ₃	P ₂
S ₄	P ₂
S ₄	P ₄

$B_1 =$

PNo.
P ₂

$B_2 =$

PNo.
P ₂
P ₄

$B_3 =$

PNo.
P ₁
P ₂
P ₄

- c. Explain the basic datatypes available for attributes in SQL. (08 Marks)
- c. Explain the basic datatypes available for attributes in SQL. (04 Marks)

OR

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

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Module-3

- 5 a. What are the components of the JDBC architecture? Describe four different architectural alternatives for JDBC drivers. (10 Marks)
- b. Why are stored procedures important? How do we declare stored procedure and how they called from application code? (05 Marks)
- c. Explain the impedance mismatch between host Languages and SQL. (05 Marks)

OR

- 6 a. What is a three tier architecture? What advantages it offer over single tier and two tier architectures? Give a short overview of the functionality at each of the three tiers. (10 Marks)
- b. What is SQLJ and how it is different from JDBC? (05 Marks)
- c. What is CGI and what problems does it address? (05 Marks)

Module-4

- 7 a. Explain an Informal design guidelines for a relational schema design. (08 Marks)
- b. What do you understand by attribute closure? Give an example. (04 Marks)
- c. Consider the following relations for published books”
Book (Book_title, Author_Name, Book_type, List_Price, Author_Application, Publisher)
Suppose the following dependencies exists
Book_Title \rightarrow Publisher, Book_Type
Book_Type \rightarrow List_price
Author_Name \rightarrow Author_Affiliation.
(i) What normal form is the relation in? Explain your answer.
(ii) Apply normalization until you cannot decompose the relations further, state the reasons behind each decomposition. (08 Marks)

OR

- 8 a. A set of functional dependencies for the relation $R\{A, B, C, D, E, F\}$ is $AB \rightarrow C, C \rightarrow A, BC \rightarrow D, ACD \rightarrow B, BE \rightarrow C, EC \rightarrow FA, CF \rightarrow BD, D \rightarrow E$. Find minimal cover for this set of functional dependencies. (10 Marks)
- b. Define fourth normal form? When is it violated? Why is it useful? (06 Marks)
- c. Why is the domain key normal form (DKNF) known as ultimate normal form? (04 Marks)

Module-5

- 9 a. Explain the desirable properties of transaction. (08 Marks)
- b. Describe the four levels of isolation in SQL. (06 Marks)
- c. What is the two phase locking protocol? How does it Guarantee serializability? (06 Marks)

OR

- 10 a. What is a time stamp? How does the system generates time stamps? (06 Marks)
- b. Describe the actions taken by the recovery manager during checkpointing. (06 Marks)
- c. Explain shadow paging with an example. (08 Marks)

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17CS54

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

Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define Language, Grammar and Automata with examples. (04 Marks)
- b. Define DFSM. Draw a DFSM to accept the Language.
 - i) $L = \{awa : w \in (a, b)^*\}$. Verify for the string aabaa. (08 Marks)
 - ii) Set of a string having a substring abb over $\Sigma = \{a, b\}$. Verify for the string aabba. (08 Marks)
- c. Convert the following NDFSM to its equivalent DFSM (Refer Fig Q1(c))



Fig Q1(c)

(08 Marks)

OR

- 2 a. Construct an NDFSM for multiple keywords
 $L = \{w \in (a, b)^* : \exists x, y \in \{a, b\}^* \text{ where } ((w = xabbaay) \vee (w = xbabay))\}$ (04 Marks)
- b. Minimize the following Finite State Machine using partition method. (Refer Fig Q2(b))

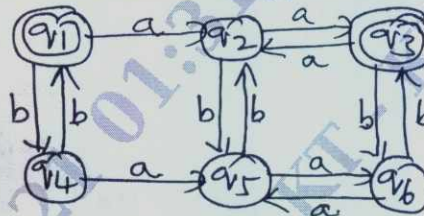


Fig Q2(b)

(08 Marks)

- c. Differentiate between DFSM, NDFSM and ϵ -NDFSM with examples. (08 Marks)

Module-2

- 3 a. Define Regular expression? Obtain the Regular expression for the following languages.
 - i) $L = \{a^{2n} b^{2n+1} ; n \geq 0, m \geq 0\}$
 - ii) $L = \{a^n b^m ; n \geq 4, m \leq 3\}$
 - iii) Set of string of 0's and 1's whose 10th symbol from the right end side is 1. Justify the answers. (08 Marks)
- b. State and prove pumping Lemma for regular languages. (08 Marks)
- c. Define Regular Grammar. Obtain Regular grammar for the language
 $L = \{w \in (a, b)^* ; w \text{ ends with the pattern } aaaa\}$. (04 Marks)

OR

- 4 a. Prove that for every regular defined by regular expression is also defined by Finite State Machine. (08 Marks)
- b. Prove that the following Language is not regular
 $L = \{w w^R ; w \in (0+1)^*\}$ is not regular (08 Marks)
- c. Construct an NFSM which accepts the regular expression $(a+b)^* abb$. (04 Marks)

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Module-3

- 5 a. Define Context Free Grammar. Obtain the Context Free Grammar for the following :
- $L = \{ww^R : w \in (a, b)^*\}$
 - Write a CFG to generate balanced parenthesis
Where $Bal = \{w \in \{ \}, ()^* ; \text{parenthesis are balanced}\}$.
Justify the answers. (08 Marks)
- b. Define Leftmost and rightmost derivations with examples. (04 Marks)
- c. What is ambiguous grammar? Show that the following grammar is ambiguous for the string $id + id * id$. $E \rightarrow E + E \mid E - E \mid E * E \mid E / E \mid id$ (08 Marks)

OR

- 6 a. Define PDA, and Instantaneous description of PDA. Obtain a PDA to accept the language.
 $L = \{wcw^R : w \in (a, b)^*\}$. Draw the transition diagram of PDA, show the moves by this PDA for the string $abcbba$. (10 Marks)
- b. What is CNF and GNF? Convert the grammar in CNF
 $S \rightarrow ABa$
 $A \rightarrow aab$
 $B \rightarrow Ac$ (05 Marks)
- c. For the following CFG
 $S \rightarrow asbb/aab$
Obtain the corresponding PDA. (05 Marks)

Module-4

- 7 a. State the prove Pumping Lemma theorem for Context Free Languages. (08 Marks)
- b. Show that $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free. (08 Marks)
- c. Remove all unit production from the grammar
 $S \rightarrow AB$
 $A \rightarrow a$
 $B \rightarrow C|b$
 $C \rightarrow D$
 $D \rightarrow E|bc$
 $E \rightarrow d|Ab$ (04 Marks)

OR

- 8 a. Explain with neat diagram, the working of a Turing Machine Model. (06 Marks)
- b. Design a Turing Machine to accept the language $L = \{0^n 1^n 2^n \mid n \geq 1\}$. Draw the transition diagram. Show that moves made by this machine for the string 001122 . (10 Marks)
- c. Briefly explain the techniques for Turing Machine construction. (04 Marks)

Module-5

- 9 a. Design a Turing Machine to accept the language $L = \{0^n 1^n \mid n \geq 1\}$. Draw the transition diagram show the moves made by this machine for the string 000111 . (10 Marks)
- b. Explain the following :
- Multitape Turing machine
 - Post correspondence problem. (10 Marks)

OR

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

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17CS551

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

Object Oriented Modeling and Design

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What is an object orientation? Explain the four aspects of Object Orientation. (06 Marks)
- b. Explain Object Oriented Themes. (06 Marks)
- c. What is a model? Explain the three models used in object orientation modeling and design. (08 Marks)

OR

- 2 a. Define the following terms with an examples:
 - (i) Links and Association
 - (ii) Multiplicity
 - (iii) Qualified Association
 - (iv) Ordering(08 Marks)
- b. Briefly explain Aggregation and Composition with an example. (06 Marks)
- c. List and explain various restricting techniques used with respect to workarounds. (06 Marks)

Module-2

- 3 a. With a neat diagram illustrate the detailed object oriented requirements definitions. (06 Marks)
- b. What is use-case and actor? With a neat diagram, describe order-entry subsystem with <<includes>> use cases. (06 Marks)
- c. List and define separate levels of use case description. Illustrate the intermediate description of telephone order scenario for create new order use case. (08 Marks)

OR

- 4 a. What is System Sequence Diagram (SSD)? Explain SSD of the simplified telephone order scenario for the create new order use case. (06 Marks)
- b. With a neat diagram, explain the activity diagram of web order scenario for the create new order use case. (08 Marks)
- c. With a neat sketch, explain partial state chart for OrderItem. (06 Marks)

Module-3

- 5 a. Explain the software development stages. (09 Marks)
- b. Differentiate between waterfall development and iterative development life cycles. (04 Marks)
- c. Explain briefly the questions to be answered by a good system concept with respect to ATM case study. (07 Marks)

OR

- 6 a. Explain the steps used to construct a domain class model. (10 Marks)
- b. Explain the steps involved in developing domain state model. (10 Marks)

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Module-4

- 7 a. With a neat diagram, explain object oriented event-driven program flow. (08 Marks)
b. What are the steps used in object oriented design process? (04 Marks)
c. What is a stereo type? With a neat diagram, explain standard stereotypes found in design models. (08 Marks)

OR

- 8 a. Explain briefly the concepts of interaction diagrams:
(i) Object responsibility (06 Marks)
(ii) Use case controller (06 Marks)
b. Discuss the symbols used in communication diagram. (06 Marks)
c. With a neat diagram, explain partial design of a three layer package for RMO. (08 Marks)

Module-5

- 9 a. What is design pattern? Explain in brief the four essential elements of pattern. (07 Marks)
b. Briefly explain how to select a design pattern. (06 Marks)
c. Explain how to use a design pattern. (07 Marks)

OR

- 10 a. Explain Intent, Structure, Applicability, Collaborations and Consequences of prototype pattern. (10 Marks)
b. Explain Intent, Structure, Applicability, Structure, Participants and Implementation of Adapter Pattern. (10 Marks)

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17CS562

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Artificial Intelligence

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define artificial intelligence. Describe the four categories under which AI is classified with? (06 Marks)
b. Describe Briefly the various problem characteristics. (07 Marks)
c. Describe the process of simulated annealing with an example. (07 Marks)

OR

- 2 a. List and explain various task domains of AI. (06 Marks)
b. Discuss A* and A0* algorithm and the various observations about algorithm briefly. (07 Marks)
c. Explain in detail about the means-end analysis procedure with example. (07 Marks)

Module-2

- 3 a. How predicate logic is helpful knowledge representation? Explain. (06 Marks)
b. Write the algorithm to unify (L1, L2). (07 Marks)
c. Describe the issues in knowledge representation. (07 Marks)

OR

- 4 a. Discuss resolution in brief with an example. (06 Marks)
b. Illustrate in detail about forward and backward reasoning with example. (07 Marks)
c. What is "matching" in rule based system? Briefly explain different proposals for matching. (07 Marks)

Module-3

- 5 a. What are the key issues which needs to be addressed by non monotonic reasoning system? Explain. (06 Marks)
b. Explain justification based Truth Maintenance System (TMS) with an example. (07 Marks)
c. Define frame. State Bayes theorem and explain notations used. (07 Marks)

OR

- 6 a. Write a note on non-monotonic logic and default logic. (06 Marks)
b. Explain abduction and inheritance. (07 Marks)
c. Explain how semantic networks are used in representation and reasoning. (07 Marks)

Module-4

- 7 a. Define conceptual dependency, mention its goals along with representation. (07 Marks)
b. List the components of the script. (06 Marks)
c. Write the algorithm for minimax (position, depth, players) and explain. (07 Marks)

OR

- 8 a. Write the algorithm for depth first iterative deepening. (06 Marks)
b. Give the reasons to build large databases. (07 Marks)
c. Write a note on global ontology. (07 Marks)

Module-5

- 9 a. Define learning. Explain with examples. (07 Marks)
b. Explain rote learning. (06 Marks)
c. Write a note on knowledge acquisition. (07 Marks)

OR

- 10 a. Explain how decision trees are used in learning. (07 Marks)
b. What capabilities are expected from expert systems? (06 Marks)
c. Write the algorithm for candidate elimination. (07 Marks)
