

Master of Computer Application
Second Semester Main Examination, June-2021
Data Base Management System [MCA201]

Time: 3:00 Hrs

Max Marks 70

Note: Answer any five questions. All questions carry equal marks.

- Q.1 (a) Discuss the main characteristics of the database approach and how it differs from traditional file system?
(b) What do you understand by distributed databases? Give the various advantages and disadvantages of distributed database management systems.
- Q.2 (a) Differentiate among candidate key, primary key, super key and foreign key.
(b) Describe the overall structure of a general database management system.
- Q.3 (a) What is normalization? Why is it needed? Discuss all the normal forms in detail.
(b) What is the difference between 3 NF & BCNF?
- Q.4 (a) Explain the structure of a B+ tree index. How is it different from a B Tree index? Explain how updates are performed in both the types?
(b) What does the DBMS do when constraints are violated? What is referential integrity? What options does SQL give application programmers for dealing with violations of referential integrity?
- Q.5 (a) Draw an ER diagram for a small marketing company database. Assume suitable data.
(b) Define the concept of aggregation. Give several examples of where this concept is useful.
- Q.6 (a) Explain deadlock prevention schemes?
(b) What are integrity constraints? Define the term primary key constraint and foreign key constraint. How are these constraints expressed in SQL?
- Q.7 Write short notes on:
(a) DBTG model
(b) ACID properties
(c) RAID

Master of Computer Application
Second Semester Main Examination, June-2021
Computer Network [MCA202]

Time: 3:00 Hrs

Max Marks 70

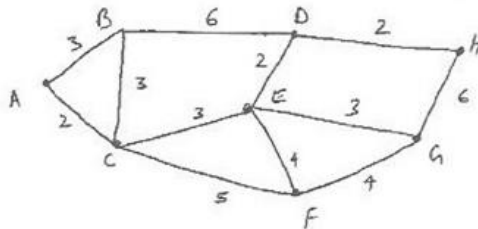
Note: Answer any five questions. All questions carry equal marks.

- Q.1 (a) Describe the ISO-OSI model with its different layers and their functions?
(b) Explain the communication media and principles IEEE standards?
- Q.2 (a) What is a routing protocol? Explain in detail about the protocol data units? What is its Key Element?
(b) What is error control? Explain CRC with an example?
- Q.3 (a) Explain Dijkstra's algorithm with an example.
(b) Explain the Bellman Ford algorithm for routing in network with an example.
- Q.4 (a) Explain CSMA and CSMA/CD protocols? Also discuss channel allocation?
(b) Define ATM? Describe the ATM service and Architecture.
- Q.5 (a) What is DNS? How resources records and maintained in DNS?
(b) What is SNMP? Explain different security level implementing in SNMP?
- Q.6 (a) Explain Network security. Describe cryptography.
(b) Why do HTTP, FTP, SMTP, POP3 and IMAP run on top of TCP rather than on UDP? Discuss.
- Q.7 (a) Give the Difference between IPV4 and IPV6 in details?
(b) What is IP addressing? What are the different addresses?
- Q.8 Write short notes on:
(a) **DQDB Protocol**
(b) **FDDI Protocol**
(c) **Fiber Optic and HFC**

Master of Computer Application
Second Semester Main Examination, June-2021
Algorithm Design [MCA204]

Time: 3:00 Hrs**Max Marks 70****Note: Answer all five questions. All questions carry equal marks.**

- Q.1 (a) What is AVL search tree? Explain the complete process of insertion in AVL search tree by taking suitable example.
 (b) What are linear and nonlinear data Structures? What are the various operations that can be performed on different Data Structures?
- Q.2 (a) How is binary search tree representation of lists advantageous over their sequential list representations?
 (b) Write short note on Bubble Sort with example.
- Q.3 (a) Define stack. How it is different from queue. Write an algorithm to implement stack using linked list.
 (b) What do you mean by Linked List? Explain various operations associated with the linked list.
- Q.4 (a) What is minimum spanning tree of the graph? Execute Prim's algorithm to find minimum spanning of the following graph.



- (b) Explain Graphs in detail & Degree 7 Sub graph.
- Q.5 (a) Explain Dijkstra's algorithm with an example.
 (b) Explain the Bellman Ford algorithm for routing in network with an example.
- Q.6 (a) Apply backtracking techniques to solve the following instance of the subset sum problem. $[S = (1, 3, 4, 5)$ and $d = 11]$?
 (b) Write a program to implement the Merge Sort Algorithm using divide and conquer strategy.

- Q.7 (a) Discuss the classes P, NP, NP complete and NP hard with example? How can we show that the problem is NP complete?
(b) Explain Branch and bound techniques in details?

Q.8 Write short notes on: (Any 2)

(a) Traveling salesman problem

(b) B+ Tree

(c) Backtracking

Master of Computer Application
Second Semester Main Examination, June-2021
Object Oriented Programming with JAVA [MCA205]

Time: 3:00 Hrs

Max Marks 70

Note: Answer all five questions.

All questions carry equal marks.

- Q.1 (a) Discuss the basic features of Java Programming methodology.
(b) Explain OOPS in detail. What are differences between JAVA and C++?
- Q.2 (a) What do you understand by Inheritance and also define its types with example?
(b) Write the difference between JDK and JRE?
- Q.3 (a) Explain the lifecycle and HTML tags for Applet.
(b) What is friend Function? What are some advantage and disadvantage of using friend functions?
- Q.4 (a) Explain the working of JDBC and ODBC bridge.
(b) What is servlet? Discuss the servlet lifecycle?
- Q.5 (a) Explain the concept of multithreading by giving suitable example?
(b) Explain in detail operator overloading and function overloading with example?
- Q.6 (a) What is constructor? Explain different type of constructors.
(b) Compare abstraction and encapsulation. Give advantage & disadvantage of polymorphism in an object-oriented system.
- Q.7 (a) Write the Difference between structure and classes in C++.
(b) What is pointer? Discuss pointer to base and derived class.
- Q.8 Write short notes on:
- (a) **Java's event delegation model**
 - (b) **Model View Controller**
 - (c) **JSP**