



OP – 290

II Semester M.C.A. Examination, November 2021  
(CBCS Scheme)

COMPUTER SCIENCE

MCA203T : Computer Networks

Time : 3 Hours

Max. Marks : 70

**Instructions :** Answer **any five** from Section – A. Answer **any four** from Section – B.

SECTION – A

Answer **any five** of the following. **Each** question carries **six** marks. (5×6=30)

1. How do we classify transmission media ? Explain the working of Co-Axial Cables with neat diagram.
2. Define Multiplexing. Differentiate Synchronous TDM and Statical TDM.
3. Explain ISDN and HDSL Technology.
4. What is the Purpose of Physical Addressing ? Discuss frame format of Physical addressing.
5. Discuss Network Performance Characteristics.
6. Explain Multicasting addressing with neat diagram.
7. Differentiate between CSMA/CD and CSMA/CA.
8. Explain Internet Protocol Routing.

SECTION – B

Answer **any four** of the following. **Each** question carries **10** marks. (4×10=40)

9. a) What is Wireless Technology ? Explain different Wireless Technology with Bluetooth. 5
- b) Explain ASDL Technology. 5

P.T.O.



OP – 290

10. Explain the function of OSI-ISO model of each layer with neat diagram and how it differ from TCP/IP Model.

11. a) What is Routing ? Explain Distance Vector Routing Protocol with neat diagram.

5

b) Explain Virtual Private Networks (VPN).

5

12. What is IPv6 addressing ? Explain IPv6 addressing in details with suitable diagram.

13. What is SONET ? Explain Working Principle of SONET with diagram.

14. What is ATM ? Explain details with neat diagram of working of ATM layers.





OP – 288

**II Semester M.C.A. Examination, November 2021**  
**(CBCS Scheme)**  
**COMPUTER SCIENCE**  
**MCA 201T : Data Structures (Equivalent to (Y2K5/Y2K12))**

Time : 3 Hours

Max. Marks : 70

**Instructions :** 1) Answer **any five** from Section – A.

2) Answer **any four** from Section – B.

**PART – A**

Answer **any five** of the following. **Each** question carries **six** marks. **(5×6=30)**

1. Define data structure. Mention the classification of data structures.
2. What is Abstract Data Type ?
3. What is recursion ? Write an algorithm to find factorial of a number using recursion.
4. Write algorithm for binary search.
5. What is stack ? Explain the basic operations of stack.
6. What is circular queue ? Mention the advantage of circular queues over ordinary queue.
7. Explain pre-order, post-order and in-order tree traversal with a suitable example.
8. What is graph ? Explain the memory representation of graph.

**PART – B**

Answer **any four** of the following. **Each** question carries **ten** marks. **(4×10=40)**

9. What is time and space complexity of an algorithm ? Explain various asymptotic notations for complexity of algorithm.
10. a) Write an algorithm for selection sort.  
b) Sort the given numbers using merge sort 6, 18, 13, 1, 19, 30, 14, 5. **(4+6)**

P.T.O.



11. What is linked list ? Write an algorithm to perform insertion and deletion operations on a circular linked list.

12. a) Write an algorithm to convert infix expression to postfix expression.

b) Evaluate the given postfix expression  $35 + 55 / 25 * +$ .

(5+5)

13. a) Write a note on BFS and DFS.

b) What is queue ? Explain linked list representation of queue.

(5+5)

14. Write short notes on the following :

a) Priority queue

b) Binary search tree.

(5+5)





**II Semester M.C.A. Examination, November 2021**  
**(CBCS Scheme)**  
**COMPUTER SCIENCE**  
**MCA 202 T : Database Management System**  
**Equivalent to (Y2K5/Y2K12 Database Management)**

Time : 3 Hours

Max. Marks : 70

**Instructions :** 1) Answer **any five** questions from Section – A.  
2) Answer **any four** questions from Section – B.

**SECTION – A**

Answer **any five** of the following. **Each** question carries **six** marks. **(5×6=30)**

1. What are the main characteristics of DBMS ?
2. Explain 3-Schema Architecture with a neat sketch.
3. Explain different types of attributes with example.
4. What are functional dependencies ? What are database anomalies and its types ?
5. Discuss the role of DBA in brief.
6. Discuss the various types of join operations in relational algebra.
7. What is concurrency ? How does one handle concurrency in Database Management System ?
8. Discuss the ACID properties of a database transaction.

**SECTION – B**

Answer **any four** of the following. **Each** question carries **10** marks. **(4×10=40)**

9. What is data model ? Explain different categories of data models.
10. Write ER diagram for Hotel Management system with at least four entities.
11. What is Normalization ? Explain 3NF and BCNF.
12. Discuss the different DML commands in sql. with suitable example.
13. What is indexing ? Why is it necessary for Database Management System ?  
Discuss types of indexes with necessary sketches.
14. Write a short note on the following :
  - 1) Triggers. **3**
  - 2) Aggregate functions. **3**
  - 3) Two-phase locking protocol. **4**



**II Semester M.C.A. (CBCS) Examination, November 2021**  
**COMPUTER SCIENCE**  
**MCA 204T : Operating System**  
**(Equivalent to Y2K5/Y2K12 Operating System and Unix)**

Time : 3 Hours

Max. Marks : 70

**Instructions :** i) Answer **any five** questions from Section – A.  
 ii) Answer **any four** full questions from Section – B.

**SECTION – A**

Answer **any five** questions. **Each** carries **6** marks. **(5×6=30)**

1. What is an Operating System ? Explain different services of an operating system.
2. Explain methods of handling Deadlocks.
3. Discuss a method to handle producer consumer problem.
4. Distinguish between segmentation and paging.
5. What is File allocation method ? Explain in detail.
6. What is protection ? Explain the goals of protection.
7. What is real time operating system ? Explain in detail.
8. What is a system call ? Explain system call parameters.

**SECTION – B**

Answer **any four** questions. **Each** carries **10** marks. **(4×10=40)**

9. Consider the following set of processes with length of CPU burst time in milliseconds arrived with different arrival time as indicated below.

Process	Arrival Time	CPU Burst-Time
P1	0	6
P2	5	10
P3	7	13
P4	11	2
P5	13	6

P.T.O.





- a) Draw Gantt's chart illustrating the execution of these processes using FCFS and SJF algorithm. 6  
4
- b) Calculate turn-around time and waiting time.
10. Consider the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6. How many page faults would occur for the following replacement algorithm ? (5+5)
- a) FIFO                      b) LRU. (6+4)
11. Consider the following system :

Allocation				
	A	B	C	D
P <sub>0</sub>	0	0	1	2
P <sub>1</sub>	1	0	0	0
P <sub>2</sub>	1	3	5	4
P <sub>3</sub>	0	6	3	2
P <sub>4</sub>	0	0	1	4

Max			
A	B	C	D
0	0	1	2
1	7	5	0
2	3	5	6
0	6	5	2
0	6	5	6

Available			
A	B	C	D
1	5	2	0

- a) Using Banker's algorithm answer the following :
- i) What is the content of matrix need ?
- ii) Is the system in a safe state ? Justify it.
- b) Write a short note on Resource Allocation Graph.
12. a) Discuss the Dining-Philosophers problem for synchronization in detail. 6
- b) What are the necessary conditions of deadlock ? Explain. 4
13. Explain the attributes and operations of file in detail.
14. Explain the directory structure in detail with a suitable example.

Process	Arrival Time	CPU Burst-Time
P <sub>1</sub>	0	10
P <sub>2</sub>	2	5
P <sub>3</sub>	4	3
P <sub>4</sub>	6	8
P <sub>5</sub>	8	4
P <sub>6</sub>	10	6