



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)