



- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagram and use supporting data wherever necessary.
 3. Avoid vague answers and write specific answer related to question.

Either:-

- a) What is data data structures? List and explain various data structures in detail. 8
- b) Write an algorithm to insert an element Item at K^{th} position in a linear array. 8

OR

- c) What is searching? Explain the concept of binary search in detail with suitable example. 8
- d) Write an algorithm to delete an element ie Item from a linear array. 8

Either:-

2. a) Define and explain Infix, Prefix, and Postfix notation with suitable example. 8
- b) Write an algorithm to insert an item in a queue using linear array. 8

OR

- c) List and explain the disadvantages of queue in detail? Explain Deque. 8
- d) Write an algorithm to delete an item from a stack. List application of stack. 8

Either:-

3. a) What is Recursion? List and explain the advantages and disadvantages of recursion. 8
- b) Write an algorithm to find the power of a number using recursion. 8

OR

- c) Explain how to solve the problem of tower of Hanoi with suitable example. 8
- d) Define link list. Explain application of linked list in detail. 8

Either:-

4. a) Define Binary tree. Explain the concept of Binary search tree in detail. 8
- b) Explain Prim's algorithm with suitable example. 8

OR

- c) What is path matrix? Define and explain spanning Tree. 8
- d) Define 8
 - 1) Depth of a Node
 - 2) Height of a Tree
 - 3) Full Binary Tree
 - 4) Strictly binary Tree.

5. Solve all the questions.
 - a) Describe memory representation of one dimensional array in brief. 4
 - b) Explain the concept of circular Queue in detail. 4
 - c) Describe the concept of double linked list. 4
 - d) Write a short note on AVL Tree. 4
