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- Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram wherever necessary.
3. Avoid vague answers and write answers relevant and specific to questions only.

Either

1. a) What is data structure? List and explain various operations performed on data structures in detail. **8**
- b) Write an algorithm to insert an element ITEM into the Kth position in a linear array. **8**

OR

- c) Explain the concept of Insertion sort with suitable example. **8**
- d) Write an algorithm to search an element using linear search. **8**

Either

2. a) Write a short note on Queue. Give the disadvantages of simple queue. **8**
- b) Write an algorithm to pop an element from stack. **8**

OR

- c) Explain the concept of circular queue in detail. **8**
- d) Write an algorithm to convert infix expression to its equivalent postfix expression. **8**

Either

3. a) Explain the problem of Tower of Hanoi with the help of diagrams. **8**
- b) Write an algorithm to traverse double linked list. **8**

OR

- c) Write an algorithm to find addition of first n numbers using recursion. **8**
- d) Write an algorithm to delete the node from given linked list. **8**

Either

4. a) Define Tree. Explain minimum spanning Tree in detail. **8**
- b) Write an algorithm to traverse a graph. **8**

OR

- c) Discuss the path matrix in detail with suitable example. **8**
- d) Write an algorithm to find the depth of a Tree. **8**
- 5.** Solve all the questions.
- a) Explain Types of arrays in detail. **4**
- b) Explain priority queue in detail. **4**
- c) List & explain properties of recursion in detail. **4**
- d) Write a short note on Binary Search Tree. **4**
