

Duration: 3hrs

[Max Marks:80]

N.B. : (1) Question No 1 is Compulsory.

(2) Attempt any three questions out of the remaining five.

(3) All questions carry equal marks.

(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any **FOUR** **[20]**
 - a List the linear and non-linear data structures with examples. **[5]**
 - b What is a graph? Explain methods to represent a graph. **[5]**
 - c Explain the advantage of circular queue over linear queue with a suitable example. **[5]**
 - d Differentiate between stack and queue. **[5]**
 - e Explain expression tree with suitable example. **[5]**
- 2 a What is Queue? Write an algorithm to implement a queue using an array. **[10]**
 - b Explain circular queue and priority queue with examples. **[10]**
- 3 a What is a Linked List? Write an algorithm to add a new node at the beginning of the Doubly Linked List. **[10]**
 - b Explain different types of Linked List. Also explain the operations on the linked list. **[10]**
- 4 a Explain the preorder, inorder and postorder traversal methods with examples. **[10]**
 - b Design a Huffman tree for the word "MAHARASHTRA". Also write the Huffman code to represent each symbol. **[10]**
- 5 a What is a Binary Search Tree? Design a Binary Search Tree for the following elements: 90, 70, 80, 50, 30, 40, 10, 100 **[10]**
 - b What is Binary Search? Write an algorithm to perform binary search. **[10]**
- 6 a Explain the collision resolution techniques. **[10]**
 - b Explain Comparison of sorting Techniques. **[10]**
