

**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 What is data structure? List out areas in which data structures are applied extensively. [5]
  - b What is a graph? Explain the representation techniques. [5]
  - c What do you understand by stack overflow and underflow? Write a algorithm to check for overflow and underflow condition of stack. [5]
  - d Explain the concept of circular queue? How is it better than a linear queue? [5]
  - e Explain the expression tree with an example. [5]
- 2 a Write an algorithm to convert given infix to postfix expression using stack. [10]
- b Explain circular queue and priority queue with examples. [10]
- 3 a What is a Linked List? Write an algorithm to delete the node at the end of the singly Linked List. [10]
- b What is Huffman coding? Write an algorithm to construct Huffman tree. [10]
- 4 a Explain the tree traversal methods with examples. [10]
- b What is a Binary Search Tree? Design a Binary Search Tree for the following elements: 50, 20, 70, 10, 40, 90, 60, 100 [10]
- 5 a Write a short note on BFS and DFS algorithm. [10]
- b Consider the following array [10]  
DATA: 53 64 23 66 98 12 76 44 33 10  
Write an algorithm to find an element 22 from the above array using binary search.
- 6 a Explain Comparison of sorting Techniques. [10]
- b Explain the collision resolution techniques. [10]

\*\*\*\*\*