

Duration: 2 hrs

[Max Marks:60]

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 THREE** [15]
 - a Explain linear and nonlinear data structures with suitable examples. [5]
 - b Define ADT. Write ADT for Queue data structure. [5]
 - c Differentiate between Linked List and array. [5]
 - d Write an algorithm for reversing a string. [5]
- 2 a Write an algorithm to implement Stack using an array. [8]
 - b Write a algorithm to reverse the singly linked list. [7]
- 3 a Write a algorithm to implement circular queue using an array. [8]
 - b Design a Huffman tree for the word "CONSTRUCTION". Also write the Huffman code to represent each symbol. [7]
- 4 a Construct a Binary Search Tree for given numbers 45, 23, 76, 11, 30, 60, 90, 25, 50, 65. [8]
 - b Write an algorithm for infix to postfix conversion. Convert the following expression to postfix $(A + B) * C - D / E$ [7]
- 5 a Write an algorithm to implement singly linked list that performs the following functions [8]
 1. Insert a node in the beginning
 2. Insert a node in the end
 3. Display the linked list elements
 - b Draw the Stack structure for each case when the following operations are performed on an empty stack. [7]
 1. PUSH A, B, C, D, E, F
 2. POP two letters
 3. PUSH G
 4. POP one letter
 5. POP four letters
 6. Pop one letter
 7. PUSH I, J
 8. POP one letter
- 6 **Write short notes on (any 3)** [15]
 - a) Doubly Linked List [5]
 - b) Double Ended Queue [5]
 - c) Types of Binary Tree [5]
 - d) Priority Queue [5]
