

(3 Hours)

[Total Marks: 80]

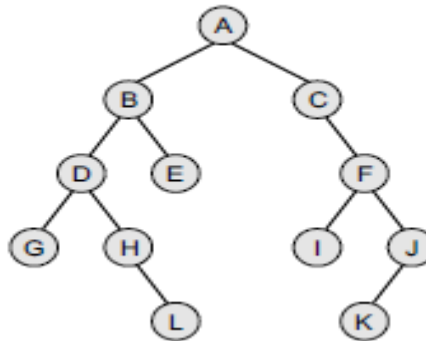
N.B.: (1) Question No.1 is compulsory.

(2) Attempt **any three** out of remaining questions.

(3) Assume Suitable data if necessary.

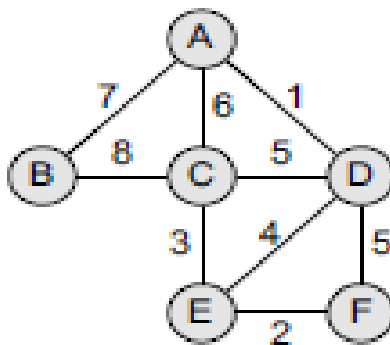
(4) **Figures** to the **right** indicate full **marks**.

- Q1. (a) Explain linear and non linear data structures. 2
- (b) Define a graph. List the types of graph with examples. 3
- (c) What is expression tree? Give Example. 3
- (d) Define asymptotic notations with an example 3
- (e) Define Double Ended queue. List the variants of double ended queue. 3
- (f) What is Recursion? State its advantages and disadvantages. 3
- (g) What is linked list? State the advantages of linked list. 3
- Q2. (a) Write an algorithm for merge sort and comment on its complexity. 10
- (b) Write an algorithm for implementing stack using array. 10
- Q3. (a) Define Binary Tree. Find in-order, pre-order and post-order of following binary tree. 10



- (b) Write an algorithm for implementing Queue using array. 10
- Q4. (a) Explain Quick sort using an example. Write algorithm for it and comment on its complexity. 10

- (b) What is collision? What are the methods to resolve collision? Explain Linear probing with an example. 10
- Q5. (a) Write an algorithm for converting infix to postfix expression. 10
- (b) Define Binary Search Tree. Write an algorithm for following operations on binary search tree 10
- (1) Insertion
- (2) Deletion
- Q6. (a) Write an algorithm for following operations on Doubly linked List 10
- (1) Insertion
- (2) Deletion
- (3) Traversal
- (b) What is Minimum Spanning Tree? Draw the MST using kruskal's and prim's algorithm and find out the cost with all intermediate steps. 10



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