

(3 Hours)

[Marks: 80]

- N.B.: 1) Question No. 1 is compulsory.
 2) Answer any three out of remaining questions.
 3) Assume suitable data if necessary.
 4) Figures to the right indicate full marks.

- Q1. (a) Explain different types of graphs with example. (5)
 (b) Write an algorithm for Binary Search (5)
 (c) Enlist the application of Trees. (5)
 (d) Define Recursion with example. State its advantages and disadvantages. (5)
- Q2. (a) Design an algorithm to insert and delete an element from a linear queue. (10)
 (b) Explain merge sort with a suitable example by giving its algorithm. (10)
- Q3. (a) Write an algorithm to convert infix expression to postfix expression. Convert the following infix expression to postfix expression using stack. (10)
 $(A+B)*(((C/D-E)+F-G)*H)$ (10)
- Q3. (b) Write an algorithm to perform following operations on doubly link list: (10)
 i) Insert a node at the beginning of link list
 ii) Delete a node from the end of link list
 iii) Display the content of link list
- Q4. (a) Explain Minimum Spanning Tree with example. Using Kruskal's Algorithm construct a minimum spanning tree for the graph shown in figure 1 and find out the cost with all intermediate steps. (10)

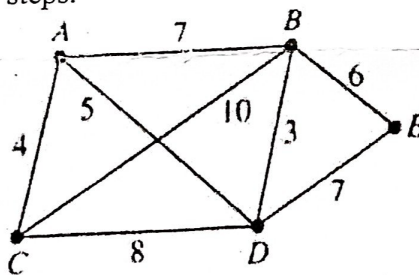


Figure 1: Graph

- Q4. (b) Define AVL Tree. Insert the following data into an AVL tree and mention the rotations at each step. (10)
 10, 16, 20, 9, 8, 14, 10, 26, 31, 15
- Q5. (a) With a suitable example explain Depth First Search Algorithm. (10)
- Q5. b) Use Linear Probing to insert the following keys into hash table of size 10. Show the resulting table after inserting the values. (10)
 22, 9, 5, 18, 14, 28, 30, 19
- Q6. Solve any Four: (20)
 a) Breadth First Search
 b) Threaded Binary Tree
 c) Types of Link List
 d) Binary Search Tree
 e) Hashing
