

(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 Linked lists in detail (5)
 (b) List down the applications of stack. (5)
 (c) Explain winding and unwinding phase of recursion. (5)
 (d) Briefly explain memory fragmentation. (5)
- Q2. (a) Design an algorithm to implement circular queue using an array. (10)
 Q2. (b) Explain quick sort with example by giving its algorithm and comment on its complexity. (10)
- Q3. (a) Write an algorithm to convert infix expression to postfix expression. (10)
 Q3. (b) Explain various collision resolution techniques in hashing. (10)
- Q4. (a) Define Minimum Spanning Tree. Construct a minimum spanning tree shown in figure 1 using Kruskal's and Prim's Algorithm and find out the cost with all intermediate steps. (10)

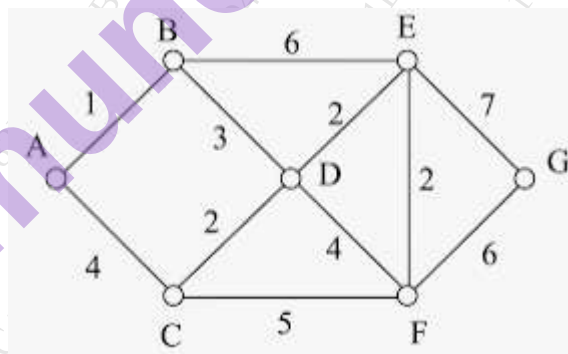


Figure 1

- Q4. (b) Define AVL Tree. Step by step construct a AVL tree for the following data
 23, 12, 25, 01, 45, 63, 27, 29, 90, 78, 5, 6, 10 (10)
- Q5. (a) Write down the algorithm for addition of two polynomials. (10)
 Q5. (b) Define Binary Search Tree. Give the algorithms for various tree traversals. (10)

Q6. Solve **any Four**:

(20)

- a) Threaded Binary Tree
- b) Depth First Search
- c) Game Tree
- d) Selection Sort
- e) B+-tree
