(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 covert 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)

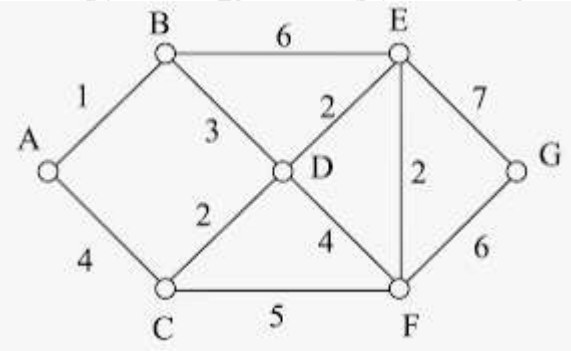

Figure 1

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

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