(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) Define Graph? Explain different types of graph.   (5)
    (b) Explain first fit, best fit and worst fit method with example.   (5)
    (c) Explain threaded binary tree.   (5)
    (d) Briefly explain memory fragmentation.   (5)

Q2. (a) Design an algorithm to perform the following operations on queue: (10)
        i)   Enqueue
        ii)   Dequeue
        iii)   Display

Q2. (b) Explain quick sort by giving its algorithm and sort the following data using quick sort.
        27, 43, 3, 9, 82, 10,38

Q3. (a) Evaluate the following expression using stack-   (10)
        (2-3+4) * (5+6*7)

Q3. (b) Explain Priority Queues and variants of Priority Queues.   (10)

Q4. (a) Construct a minimum spanning tree for the graph shown in Figure 1, using Kruskal's
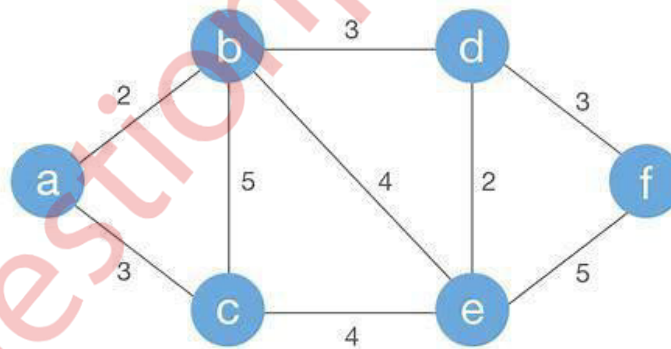   and Prim's Algorithm and find out the cost with all intermediate steps.   (10)

Figure 1: Graph

Q4. (b) Define AVL tree. Step by step construct an AVL tree for the following data: (10)
    30,20,10,25,40,50,55,22,23

Q5. (a) Explain different hash functions. Assume a table has 8 slots (m=10). Using Linear probing,
    insert the following elements into the hash table. 44, 36, 18, 77, 457 64, 10, 5, and 15 are
    inserted in the order.   (10)

Q5. (b) Define Binary Search Tree. Construct the binary search tree from following traversal: (10)
        In-order: D B H E A I F J C G
        Pre-order: A B D E H C F I J G

Determine the post-order of the tree drawn.

Q6. Solve any Four: (20)
  a) Graph Traversal Algorithm
  b) Game Tree
  c) Radix Sort
  d) B-tree
  e) Round Robin Scheduling

                  ****

86311