(Time: 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 **(10)**

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

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)**

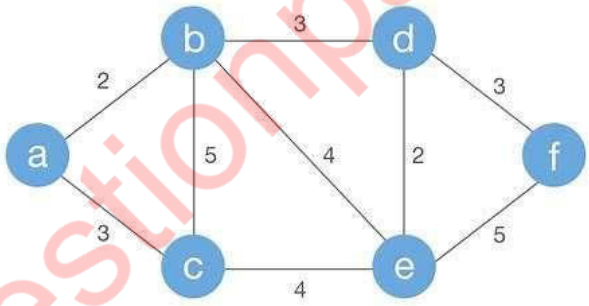


Figure 1: Graph

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: 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. **(10)**

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

X525YDB9D7CX525YDB9D7CX525YDB9D7CX525YDB9D7C