

Assignment – 1

Ques. 1 Convert the following infix expression to prefix and postfix expression. Show all steps.

- i. $A+B*C-D+E/F+(G-H)$
- ii. $(A+B)*(C-(D-E)+F)-G$

Ques. 2 Explain the concept of recursion with example.

Ques. 3 What are AVL trees? Explain various types of rotations required in balancing an AVL tree. Construct AVL search tree by inserting the following elements in order of their occurrence

68, 5, 38, 24, 18, 116, 92, 82, 48

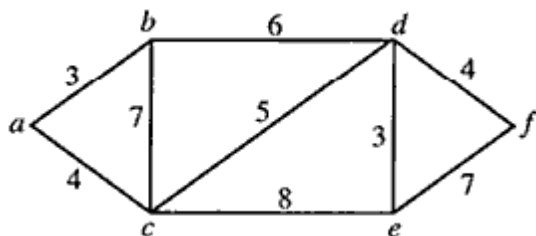
Ques. 4 Construct a B tree of order 5 for the list of elements

2, 8, 5, 6, 13, 9, 14, 12, 24, 18, 15, 5, 16, 20, 21

Ques. 5 Differentiate between Depth First Search (DFS) and Breadth First Search (BFS).

Ques. 6 Explain Prim's algorithm for minimum spanning tree with example.

Ques 7. Find shortest path for a to f using Dijkstra's algorithm.



Ques 8. Sort using Quick sort algorithm.

36, 25, 32, 5, 8, 65, 38, 47, 95

Assignment 2

Ques. 1 Write down the applications of data structures in Operating system and DBMS.

Ques. 2 Write short notes on

- a. Binary search tree**
- b. Heap sort**
- c. Huffman tree**
- d. Complete Binary tree**

Ques. 3 Write an algorithm for Towers of Hanoi problem. Also explain with example.

Ques. 4 The binary tree T has nine nodes. The inorder and preorder traversal of T yield the following sequence of nodes

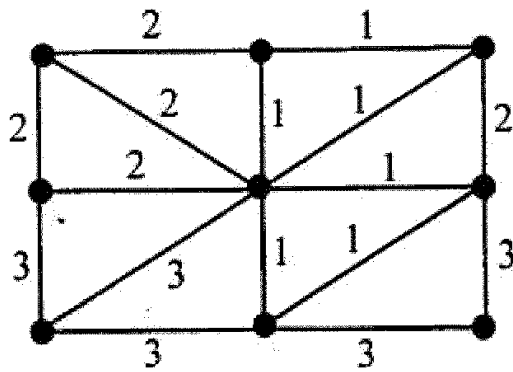
Inorder: E A C K F H D B G

Preorder: F A E K C D H G B

Draw binary tree for above sequence.

Ques 5. Define B tree of order m. When it is preferred to use B tree? Construct a B tree of order 3 by inserting the following keys in the order shown: M, Q, A, M, P, W, X, T, G, E, Y

Ques 6. What is a minimum spanning tree? Find the minimum spanning tree of following graphs:



Ques 7. What is the complexity of following code:

```
Int counter =0;
for(i=0;i<n;i++)
    for(j=0; j<n*n; j++)
        counter++;
```

**Ques. 8 Construct a Min-Heap tree for the following nodes.
8,15,24,48,3,12,18,32,54,11,6**