(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) With a neat diagram explain different types of link list.   (10)
Q1.(b) Define Graph. With a neat diagram explain different types of graph.   (10)

Q2. (a)Write an algorithm to covert infix expression to postfix expression. Convert the following
infix expression to postfix expression using stack-   (10)
$$K+L-M*N+(O\hat{}P)*W/U$$

Q2. (b)Write an algorithm to perform following operations on circular link list: (10)
    i)   Insertion from the End
    ii)   Deletion from End
    iii)   Display the contents of list

Q3. (a) Define B-tree. Step by step construct a B-tree for the following data for order 5:   (10)

    20,30,35,15,85,10,55,60,25,89,90,100

Q3.(b) Define AVL tree. Construct an AVL tree from the following data and mention the rotations
    in each step 51,26,11,6,8,4,31,21,9,16   (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.
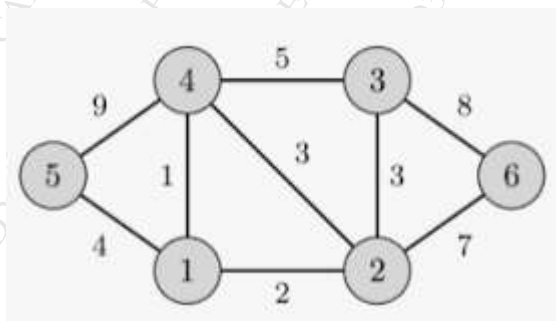   (10)

Figure 1

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Q4.(b) Explain graph traversal algorithms and traverse the graph shown in figure 2 using Breadth and Depth first search techniques:
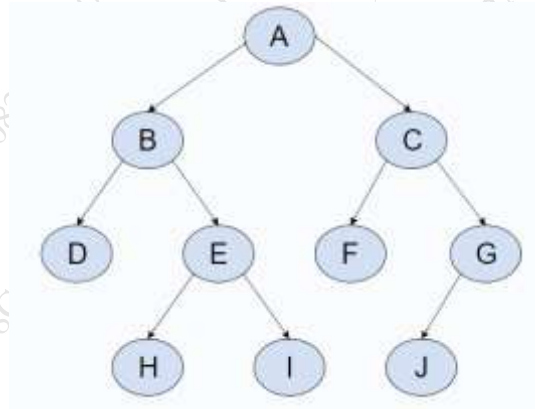

Figure 2: Graph

Q5.(a) Explain the method of collision resolution. With the help of example explain linear probing collision resolution technique. (10)

Q5.(b) Define Binary Tree. Construct the binary tree from following data: (10)

In-order Traversal: 4,2,1,7,5,8,3,6

Post-orderTraversal:4,2,7,8,5,6,3,1

Q6. Solve **any Four:** (20)

    a) Game Tree
    b) Threaded Binary Tree
    c) B+-tree
    d) Graph Representation Techniques
    e) Huffman Coding

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