GLS UNIVERSITY
FACULTY OF COMPUTER APPLICATIONS AND INFORMATION TECHNOLOGY
BCA SEM III
Data Structure
Theory Assignment – 4

Q-1 True or False

1. Tree is a linear data structure.
2. In a tree data structure, the first node is called as Root Node.
3. In a tree data structure, the node which is predecessor of any node is called as PARENT NODE.
4. In a tree data structure, the node which is descendant of any node is called as CHILD Node
5. In a tree data structure, the total number of children of a node is called as DEGREE of that Node.
6. A BST is also known as ordered binary tree.
7. An edge is a connecting link between two vertices.
8. A weighted egde is an edge with cost on it.
9. A directed edge is said to be outgoing edge on its destination vertex.
10. If an edge is directed, its first endpoint is said to be origin of it.

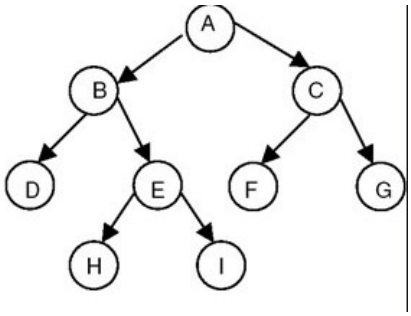
Q-2 Fill in the Blanks

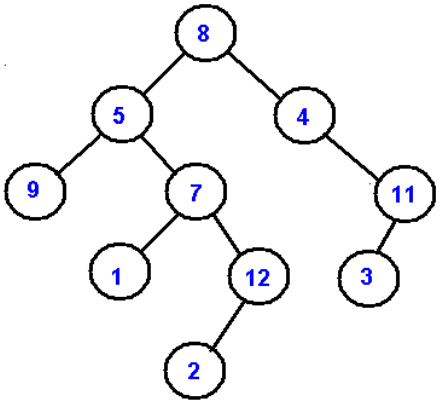
1. Tree is a _____ type of data structure.
2. A tree is a structure consisting of one node called the _____
3. _____ is a application of tree.
4. In a tree data structure, the connecting link between any two nodes is called as _____
5. In a tree data structure, nodes which belong to same Parent are called as _____
6. In a tree data structure, the node which does not have a child is called as _____
7. In a tree data structure, the node which has atleast one child is called as _____
8. A tree whose elements have at most 2 children is called a _____ tree.
9. A tree data structure can be represented_____ and _____ representation.
10. Formula of Balance Factor = _____
11. A individual data element of a graph is called as _____
12. A graph with undirected and directed edges is said to be _____ graph.
13. Total number of edges connected to a vertex is said to be _____ of that vertex.
14. A _____ is said to be simple if there are no parallel and self-loop edges.
15. Graph Data structure is represented using _____ and _____ representation.

Q-3 Answer the following questions:

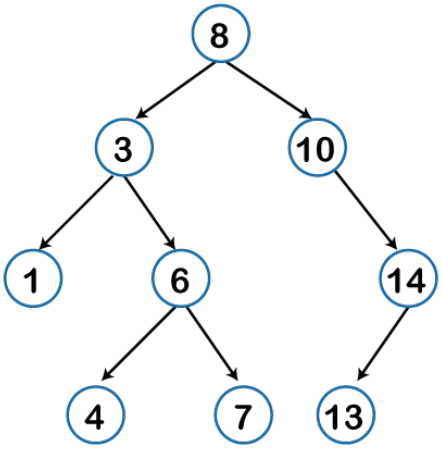
1. Explain the following terms of Tree with its representation:
   Leaf Node, Root, Subtree, Height, Level, Sibling, Path
2. What is Binary Tree explain with example.
3. Construct the BST of following Data:
   30,20,18,5,40,3,28,35,15,22,38
4. Perform the Inorder,

   Preorder and Postorder on following Tree;

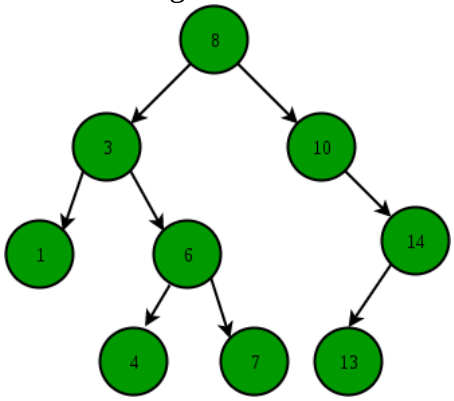




5. Find the Balalance Factor of Following tree and also define the critical nodes:

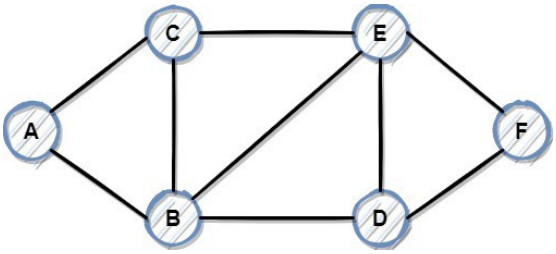


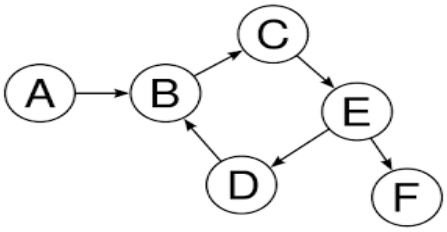
6. Convert the Following tree in Threaded Binary Tree:



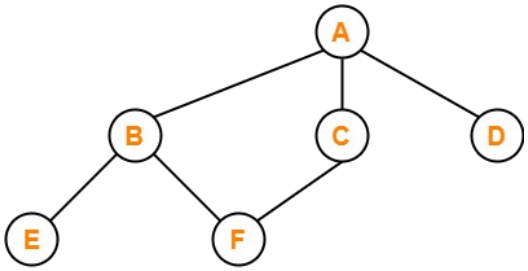
7. What is Graph? Explain the following terms of Graph:
   Edge, Vertices, Path, Degree(in,out), Directed Graph, Indirected Graph, Weighted Graph

8. Represent the following graph in Adjacency Matrix and List:





9. Traverse the following graph using DFS and BFS:



Depth First Search Example

10. Perform the Minimum Spanning tree: Prims and Krushklal Algorithm