B.Tech Sem – IV (2007 Course) (Computer Engg.) : WINTER - 2017

SUBJECT: ADVANCED DATA STRUCTURES

Day: **Wednesday** Time: **02.30 PM TO 05.30 PM**
Date: **22/11/2017** **W-2017-2407** Max. Marks: 80

N.B.:

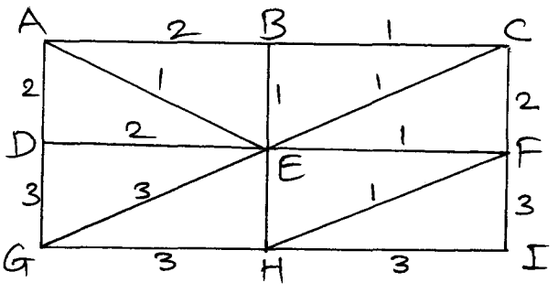
1) **Q. No. 1** and **Q. No. 5** are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer books
4) Draw diagrams **WHEREVER** necessary.

SECTION-I

Q.1 **a)** What is a binary tree? Write a pseudo code with non- recursion to insert a node in a binary tree. **(05)**

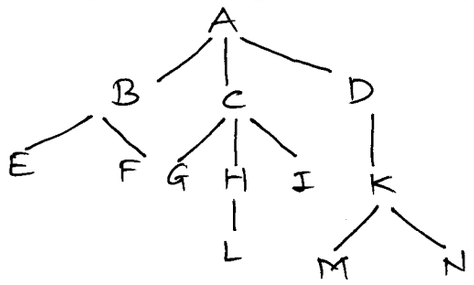
b) Enlist the advantages of AVL tree. Explain the AVL balance factor with suitable example. **(05)**

c) For the graph given in the figure generate the adjacency list and perform BFS and DFS. **(04)**



Q.2 **a)** The inorder and preorder traversal of a binary tree is given as follows: **(07)**
Inorder sequence: DBEAFCG
Preorder sequence: ABDECFG
Construct a binary tree from above traversal sequence and perform postorder traversal on generated tree.

b) What is the necessity of converting a tree into binary tree? Given the following tree. **(06)**



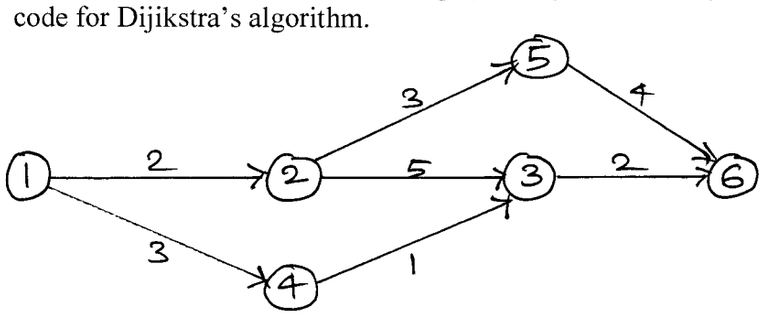
Convert it into a binary tree and list down the steps for the same. And also perform the inorder, preorder and postorder traversal on generated binary tree.

Q.3 **a)** Construct an AVL tree by inserting the following elements in the order of their occurrence. **(07)**
10, 20, 15, 25, 30, 16, 18, 19.
Explain balance factor and need of rotations in AVL tree.

b) What is minimum spanning tree? How Prim's algorithm is different from Kruskal's algorithm? **(06)**

P. T. O.

Q.4 **a)** For a given graph find the shortest path using Dijikstra's algorithm with the pictorial representation of each step (starting vertex is 1). Write the pseudo code for Dijikstra's algorithm. **(07)**



b) Write Pseudo code for depth first traversal of graph and explain with suitable example. **(06)**

SECTION-II

Q.5 **a)** What are static and dynamic trees? Distinguish between BT, BST, OBST & AVL tree. **(05)**

b) Describe concept of record with example. **(04)**

c) Explain backtracking with example of 8 Queen's problem. **(05)**

Q.6 **a)** Explain symbol table with help of neat diagram. **(07)**

b) Define and compare B^+ and B^* trees. **(06)**

Q.7 **a)** Write C / C++ implementation for a Direct file organization. **(07)**

b) Explain Relative File organization with example. **(06)**

Q.8 **a)** Discuss all pair shortest Path Algorithm with example. **(07)**

b) Explain Traveling Salesperson problem with example. **(06)**

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