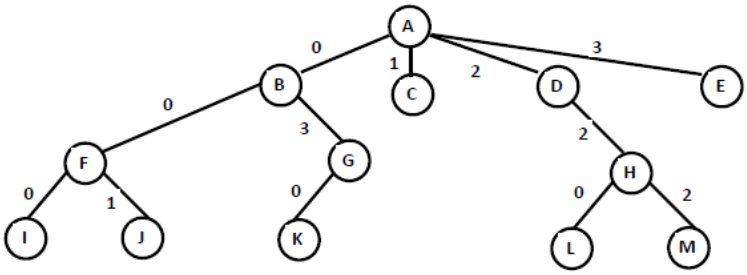
Tutorial and Assignment Sheet – ODD 2022

15B11CI311 – Data Structures

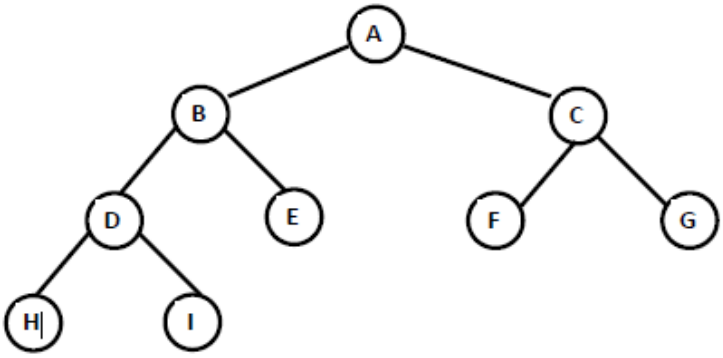
Week 8 (03 Oct – 09 Oct, 2022)

Q.1. In K-ary tree, each node (except leaf nodes) can have at most K branches (i.e. children). Following figure shows an example of a K-ary tree where K is 4. In this figure, the numbers associated with each edge represents the Branch No. / Child No. (Ranging between 0 and 3 because K is 4) of the parent node. Write Pre , Post and inorder traversal of the tree if inorder is in the branch sequence – (0 1 root 2 3).



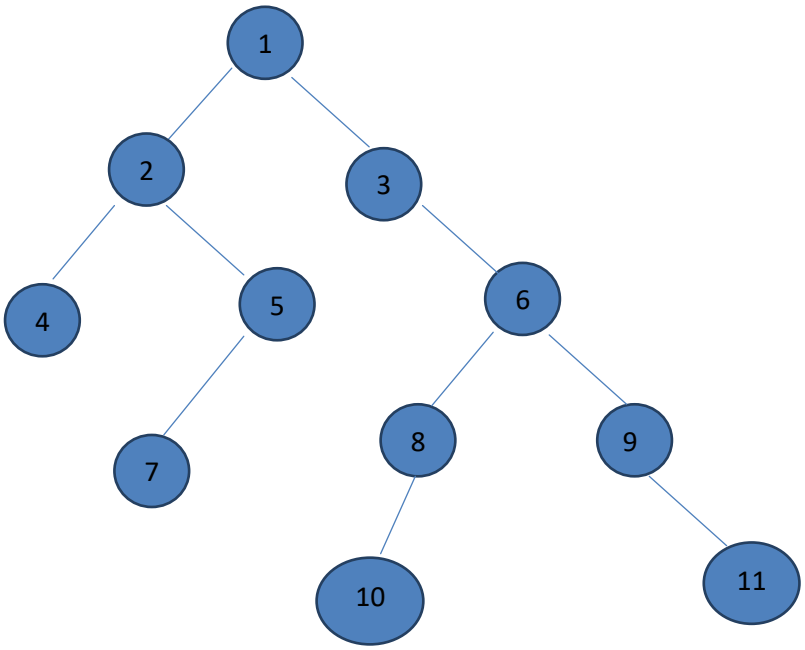
Q2. You have been given a list of characters LIST as {A, B, C, D, E, F, G, H, and I) in tree below.

A. Is it a complete tree? Why Yes/No?
B. Write array representation of following Binary tree.
C. Given index of a child node how will you access its parent node index
D. Given index of a parent node how will you access its left and right child index
E. If a tree is left skewed is array representation an efficient one? Why?



Q3. You have been given above Tree in Q 2. Write logic (recursive and iterative) to find the height and depth the given binary tree.

Q4.



A) Write Inorder, preorder and postorder traversal of the above Binary Tree.
B) Insert elements in above Binary tree in a BST
C) Write Inorder, preorder and postorder traversal of the above BST
D) Given only Preorder traversal of the BST tree created in part B) write steps to get the postorder traversal of BST
E) Given only Postorder traversal of the BST tree created in part, write steps to get the preorder traversal of BST
F) Find maximum and minimum (recursive and iterative) element of the BST

Q5. You have been given root of a binary tree (not necessarily complete binary tree) . Write iterative logic to find postorder traversal using one stack.