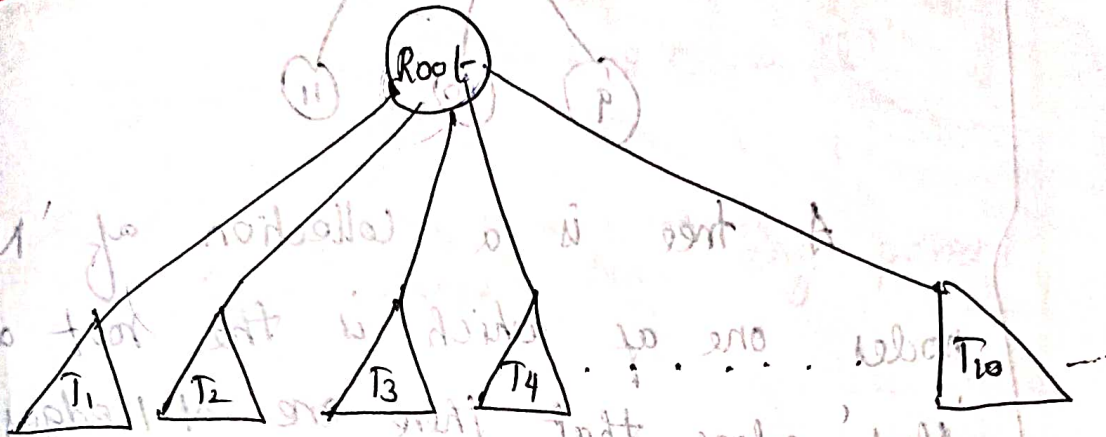


Unit-2

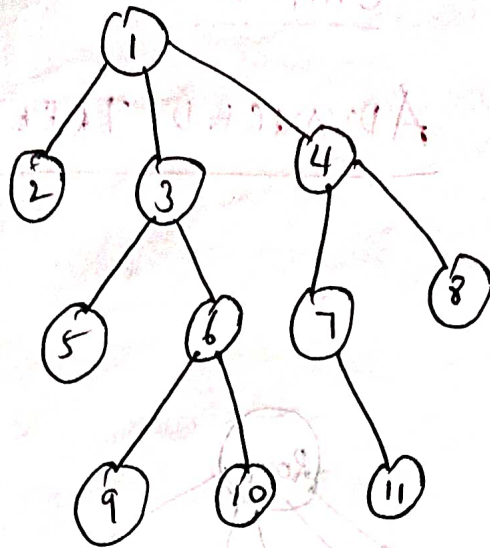
ADVANCED TREES

TREE



* A Tree is a collection of nodes, the collection can be empty or otherwise a tree consist of distinguished node Root called the Root.

* Zero or more non empty sub-trees T_1, T_2, \dots, T_k each of whose roots are connected by directed edge from 'R', the root of each subtree is said to be child of 'R' and 'R' is parent of each sub-tree root.



A tree is a collection of 'N' nodes one of which is the root and 'N-1' edges that there are N-1 edges follow. From the fact that each edge connects some node to its parents and every node except the root has one parent.

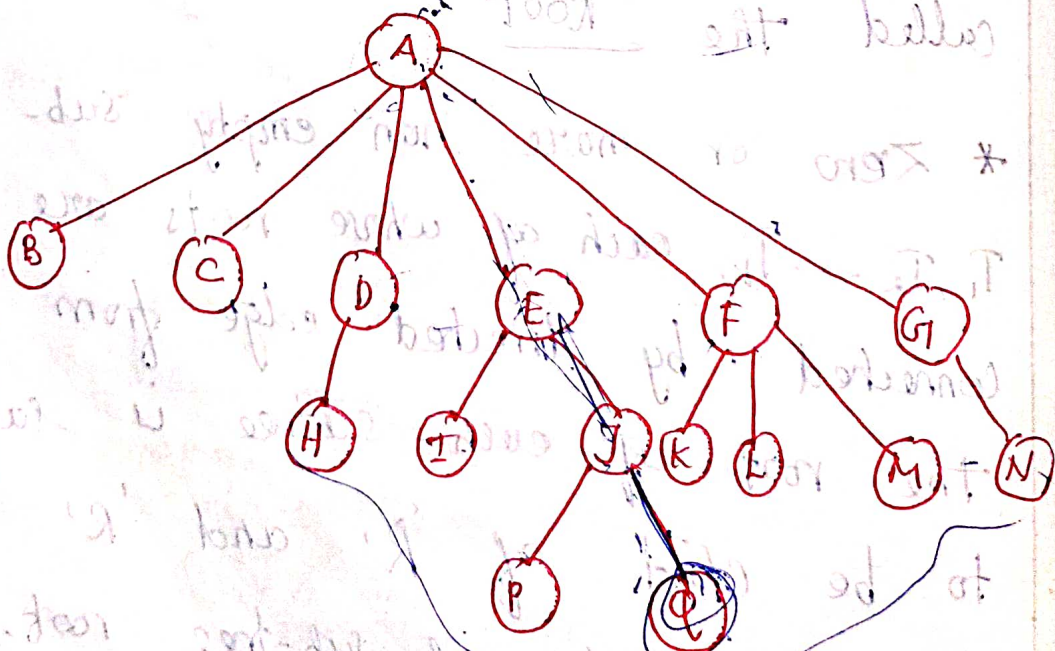


Fig. A Tree

Tree Terminology

Node:-

Item of information is called as node.

Eg. In above tree A, B, C, ..., Q

Root:-

Root doesn't have any parent node.

node.

Eg. A is Root node

Leaves:-

The nodes doesn't have child nodes.

nodes.

Ex. B, C, H, I, P, Q, K, L, M, N

Siblings:-

Node with same parent are called siblings.

called

siblings.

Ex. {B, C, D, E, F, G}, {I, J}, {K, L, M}, {P, Q}

Path:-

A path from node n_1 to n_k is

defined as sequence of nodes n_1, n_2, \dots, n_k

such that n_i is the parent of n_{i+1}

for $1 \leq i \leq k$

Ex. path of

Length :-

The length of the path is number of edges on the path. There is a path of length 0 from every node to itself

Ex. A to H = 2 edges
A to P = 3 edges

Depth :-

For any node, the depth of 'ni' is the length of the unique path from the root to ni. The root is at depth 0.

Ex. Depth of Q = 3

Height of leaf nodes = 0

Height of E = 2

Height :-

The height of 'ni' is the length of longest path from ni to a leaf. Thus all leaves are at height 0.

The height of the tree is height of the root node.

Eg Depth of E = 1
Height of E = 2