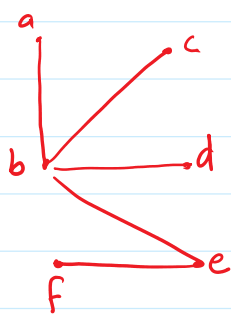
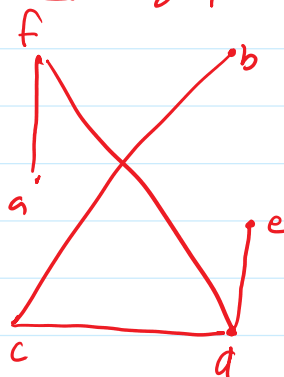


lecture 28:- TREE "A Connected graph with no Simple Circuits."

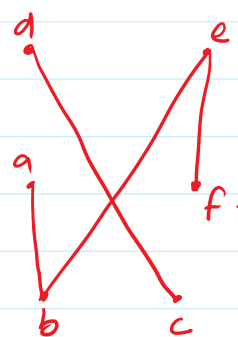
Ex 2 / p 624:-



G_1



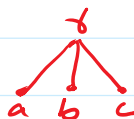
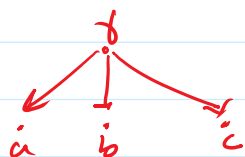
G_2



G_3



Rooted Tree:- A tree in which one vertex is designated to be the root & every other edge is directed away from the root.



parent:- a is the parent of b , when \exists an edge (a,b) .

child:- " u is child of b " (a,b) .

Sub-Tree:-

Sibling:- Vertices with same parents.

leaf:- Vertices with no child.

Ancestors:-

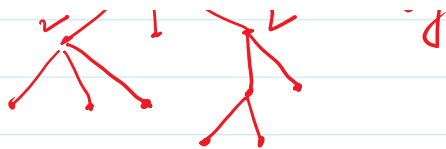
Descendants:-

Internal Vertex:- Every vertex having children.

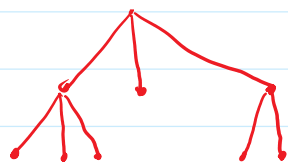
m-ary Tree:- if Every Internal Vertex has no more than m children.



3-ary tree.



full m-ary tree:- If every Internal Vertex has exactly m children. $m=2$.

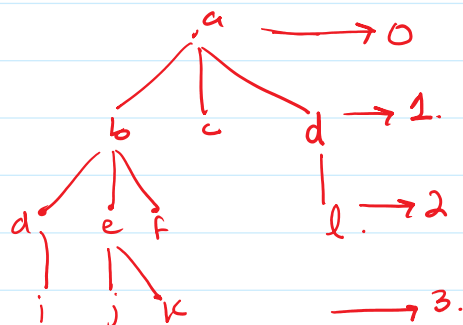


Binary Tree:-

Ex 3, 4. IP 627.

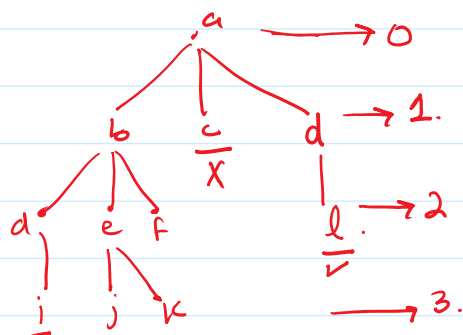
- 1- left child
- 2- Right child.
- 3- left Sub tree.
- 4- Right u u.

levels:-



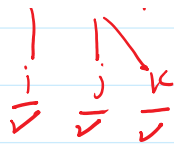
Height = highest level.
= 3.

Balanced Tree:- A rooted tree is balanced if all leaves are at level h or $h-1$. (h = height of tree).



$h=3$.

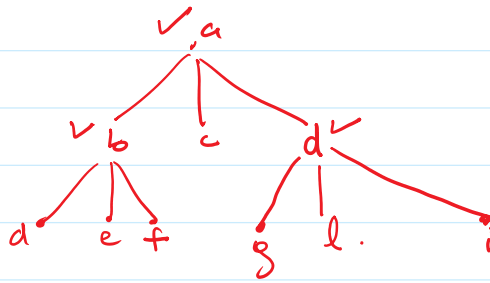
X.



$\rightarrow 3.$

X.

- Properties:-
- 1) A tree with n Vertices will have $n-1$ edges.
 - 2) A full m -ary tree with i internal Vertices contain $n = mi + 1$ Vertices.



PB33-635

Ex. 1-30.

Application of Trees.

1. Binary Search Tree.

Ex1 :-
PB36

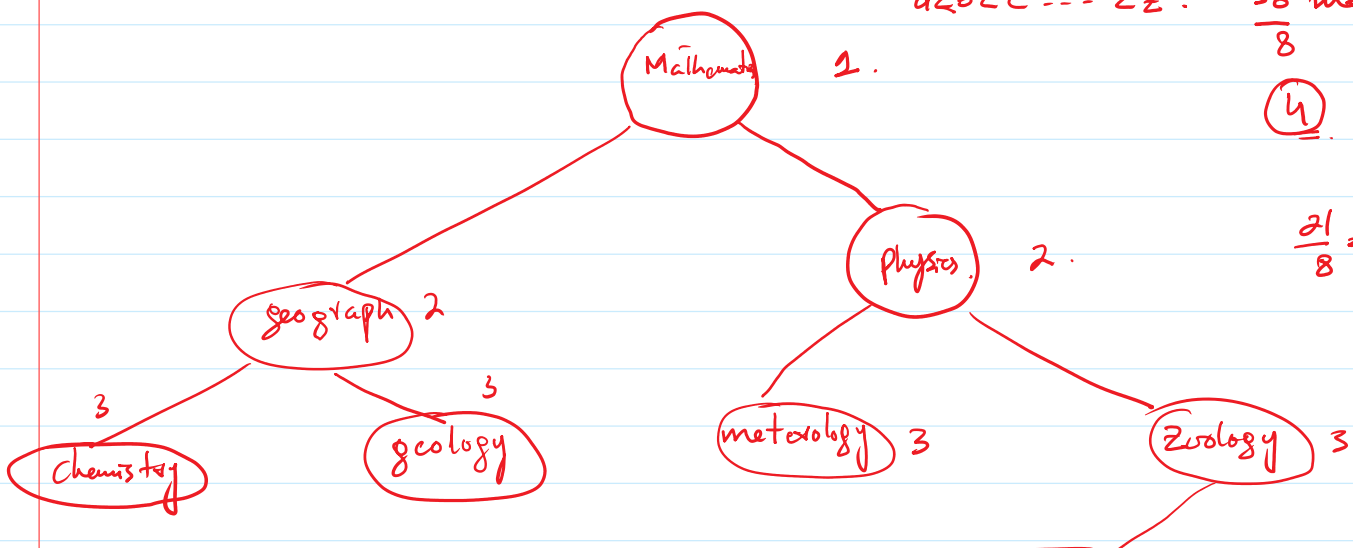
[Mathematics, physics, geography, zoology, meteorology, geology, psychology, chemistry].

$$1+2+3+4 \dots + 8.$$

$$a < b < c \dots < z. \quad \frac{36}{8} \text{ matches.}$$

$$\frac{36}{8} = 4.5$$

$$\frac{21}{8} = 2.5$$



Chemistry

8-01

-U

-U

psychology 4

