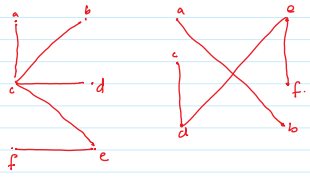
Dec # 27. Trees.

1- Connected
2- Undirected
3- No Simple Circuit

Ex 1 :- 624



Rooted tree :-
Parent :-
Child :-
Ancestors :-
Descendants :-
Sibling :-
leaf :-
Internal Vertex :-
m-ary tree.

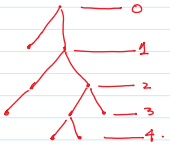
Ex 3 627

3-ary tree.

Full m-ary tree.

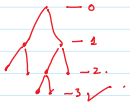
Full-4-ary tree.

Height of a tree.



H = 4.

Balanced tree :- All leaf Vertices are at level h or h-1
h = height of tree.



Theorem 2
P630. A tree with n Vertices has n-1 edges.

Theorem 3: P630
A full m-ary tree with i internal Vertices has n = mi+1 Vertices.

Full 5-ary tree.

i = 3.
m = 5

n = 5 x 3 + 1 = 16.

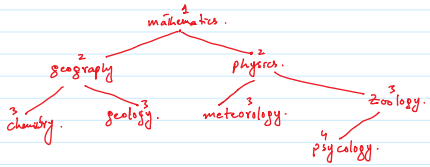
Applications of trees.

1- Binary Search tree.

Ex 1 :- 636

[mathematics^{1}, physics^{2}, geography^{3}, zoology^{4}, meteorology^{5}, geology^{6}, psychology^{7}, chemistry^{8}].

$\frac{1+2+3+4+\cdots+8}{8} = \frac{36}{8} = 4.5$.

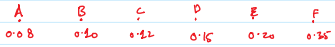


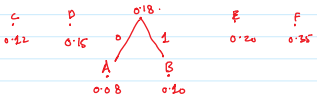
1+2+2+3+3+3+3+4 21 - 2.625.

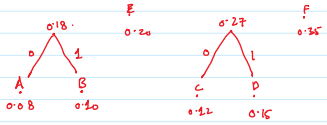
chemistry. geology. meteorology. psychology.

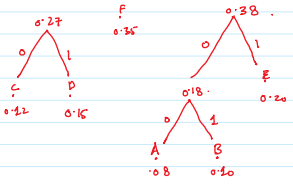
$\frac{1+2+2+3+3+3+3+4}{8} = \frac{21}{8} = 2.625.$

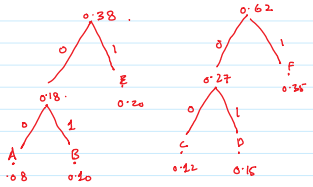
2- Huffman Coding.

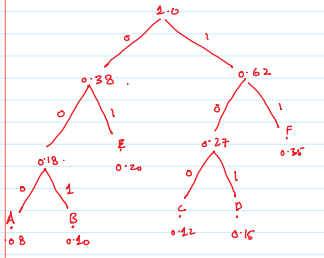












= A = 000 = 3 x 0.08 = 0.24
= B = 001 = 3 x 0.10 = 0.3
= C = 100 = 3 x 0.12 = 0.36
= D = 101 = 3 x 0.15 = 0.45
= E = 01 = 2 x 0.20 = 0.4
= F = 11. = 2 x 0.35 = 0.7

2.45