

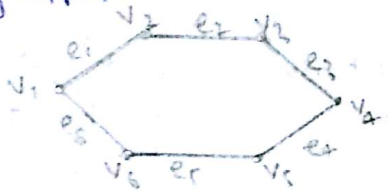
ASSIGNMENT-02

Q-1 Define the following with an example.

- 1) Simple graph: A graph which do not contain self loop and parallel edges such are called

Simple graph.

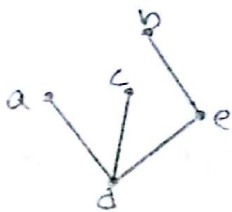
Eg.



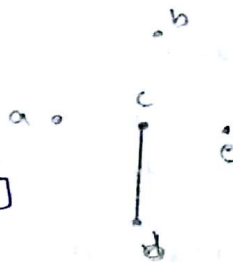
- 2) Subgraph: If $G = (V, E)$ is a graph [directed or undirected] when, $G_1 = (V_1, E_1)$ is called a subgraph of G if $\phi \neq V_1 \subseteq V$ and $E_1 \subseteq E$, where each edge in E_1 is incident with vertices in V_1 .

Eg. Undirected:

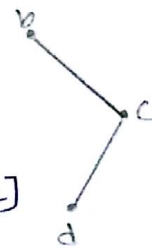
(G)



[G1]



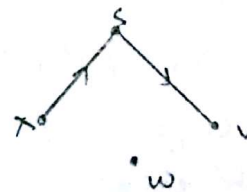
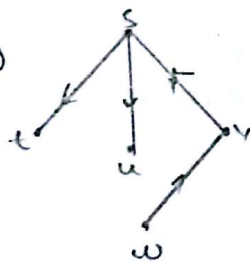
[G2]



In the above eg. graph G_1 and G_2 are the subgraphs of G .

directed:

(G)

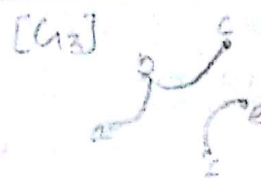
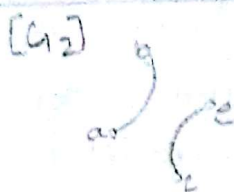
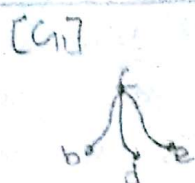


- 3) Induced subgraph: $[U]$
Let $G = (V, E)$ be graph [directed or undirected] if, $\phi \neq U \subseteq V$, is subgraph of G induced by U , is a subgraph whose vertex set is U and which contains all edges [from G] of either the forms

i) (x, y) , for $x, y \in U$ [when G is directed]

ii) (x, y) , for $x, y \in U$ [when G is undirected].

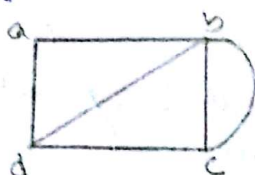
eg.



4] Maximal Sub-graph:

A block (or) biconnected connection is a maximal graph in which every vertices (or) edges belong to a simple cycle

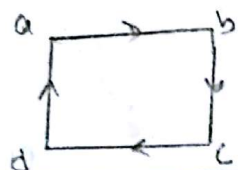
Eg.



5] Regular graph:

Every vertex has the same number of neighbours (or) valency in degree, out degree.

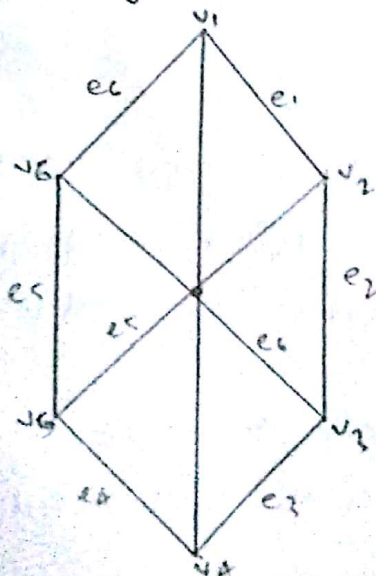
Eg.



Q-3] Determine the order, $|V|$ of the graph $G=(V,E)$ in the following cases:

- G is cubic with 9 edges
- G is regular graph with 15 edges
- G has 10 edges with two vertices of degree 4 and all others of degree 3.

Ans a) Eg.

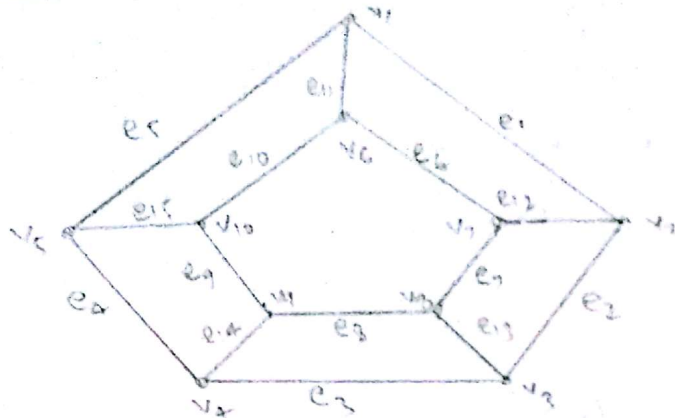


$\therefore$ degree of all the vertices is 3

$$|E| = 9$$

$$\text{i.e.; } |V| = 6$$

b)

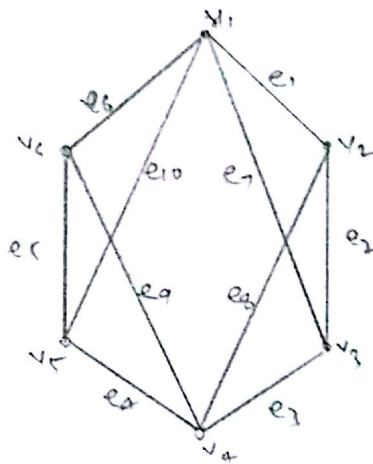


here all the vertices have 15 edges

$$|E| = 15$$

$$\text{i.e., } |V| = 10$$

c)



$$\deg(v_1) = 4$$

$$\deg(v_4) = 4$$

$$\deg(v_2) = \deg(v_3) = \deg(v_5) = \deg(v_6) = 3$$

$$\therefore |V| = 6$$

$$|E| = 10$$

Q-3
Ans

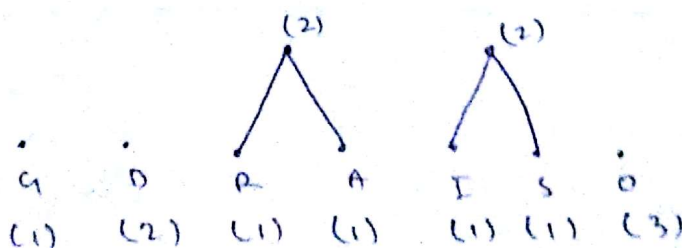
obtain the optimal prefix code for the string "ROAD IS GOOD".

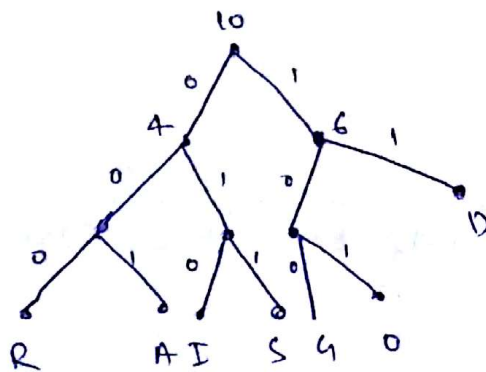
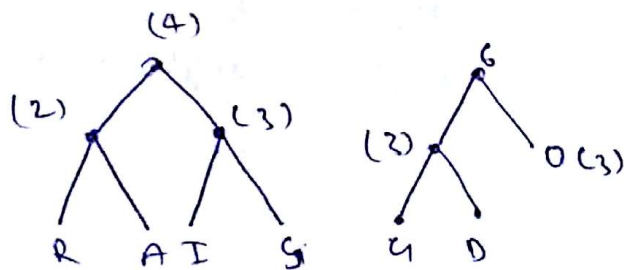
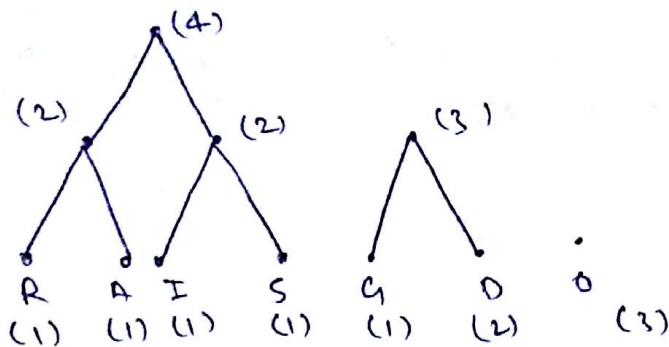
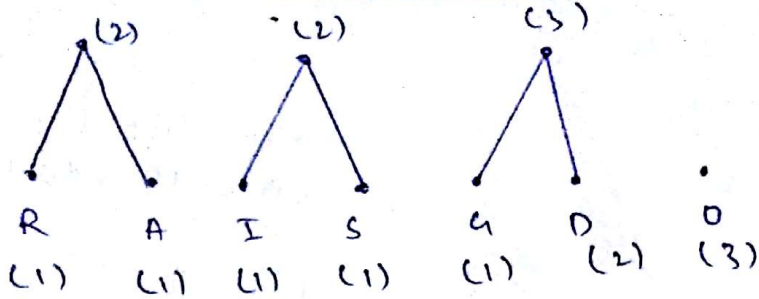
R O A D IS G O O D

(1) (3) (1) (2) (1) (1) (1)

R	A	I	S	G	O	O
(1)	(1)	(1)	(1)	(1)	(2)	(3)

Arranging them in the decreasing order of the frequency





R = 000
 A = 001
 I = 010
 S = 011
 G = 100
 O = 101
 D = 11

'ROAD IS GOOD'

=> 00011001101010011100111101