6/10/22

DMGT — Tutorial - 5

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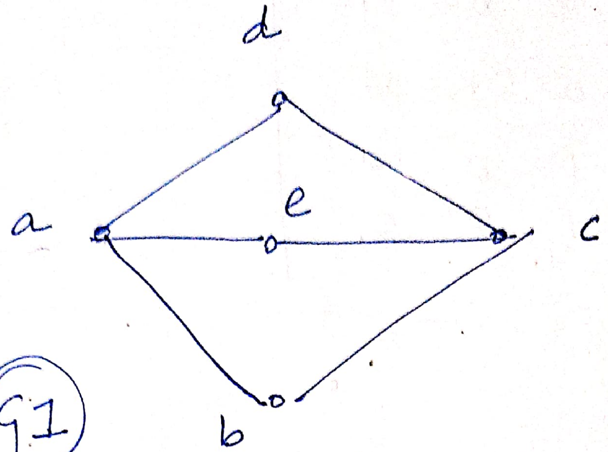
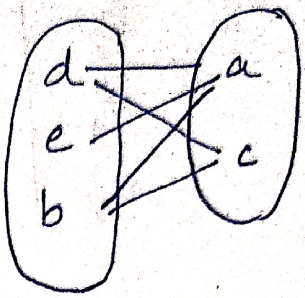
Q.1.



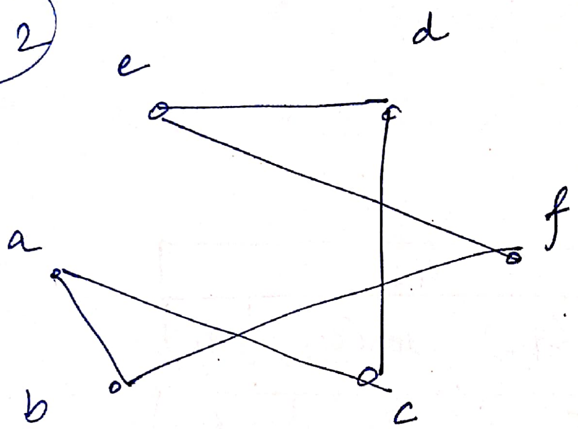


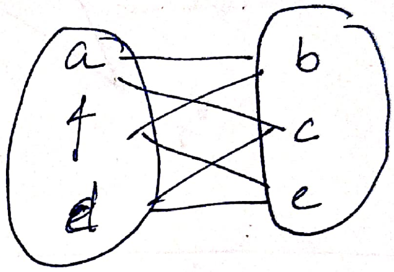
G1

2 groups

G1 → Bipartite ✓

G2





2 grps

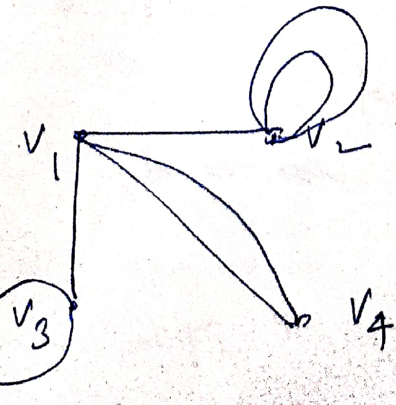
G2 Also bipartite.

Q.2.

(1) $A(G) =$

$$\begin{array}{c|c} & \begin{matrix} v_1 & v_2 & v_3 & v_4 \end{matrix} \\ \begin{matrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{matrix} & \begin{bmatrix} 0 & 1 & 1 & 2 \\ 1 & 2 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 2 & 0 & 0 & 0 \end{bmatrix} \end{array}$$

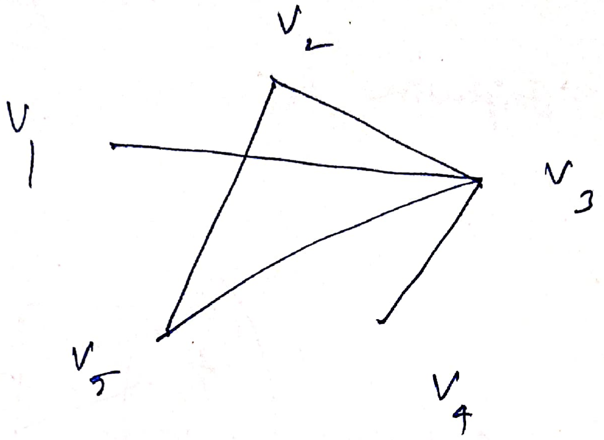
G =



(2)

$$A(G) = \begin{array}{c|ccccc} & v_1 & v_2 & v_3 & v_4 & v_5 \\ \hline v_1 & 0 & 0 & 1 & 0 & 0 \\ v_2 & 0 & 0 & 1 & 0 & 1 \\ v_3 & 1 & 1 & 0 & 1 & 1 \\ v_4 & 0 & 0 & 1 & 0 & 0 \\ v_5 & 0 & 1 & 1 & 0 & 0 \end{array}$$

$G =$



p. 3.

G_1			G_2		
vertices	deg	adj (G1)	ver (G2)	deg(G2)	adj
a	2	3, 3	v	2	3,3
b	3	2, 4, 2	u	3	3, 4, 2
c	2	3, 3	t	2	3,3
d	3	2, 3, 4	p	3	2,3,4
e	3	3, 4, 3	r	3	3, 4, 3
f	3	4, 3, 2	s	3	4, 3, 2
g	4	3, 3, 3, 3	q	4	3,3,3,3

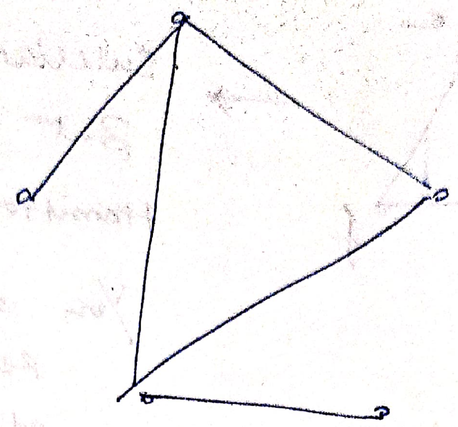
as No. of edges (G_2) = No. of edges G_1

No. of vertices also equal

adjacent vertices degrees also equal,

G_1 is isomorphic to G_2

Q.4.



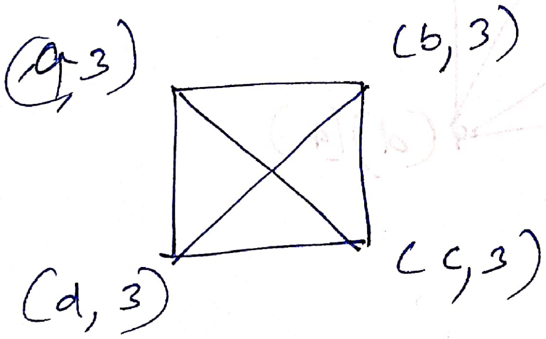
Not possible

as this would lead to a graph with an odd number of vertices with odd degrees.

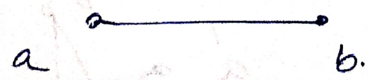
This is not possible as sum of degrees must be even in this case.

Q.5.

(1) Regular complete graph

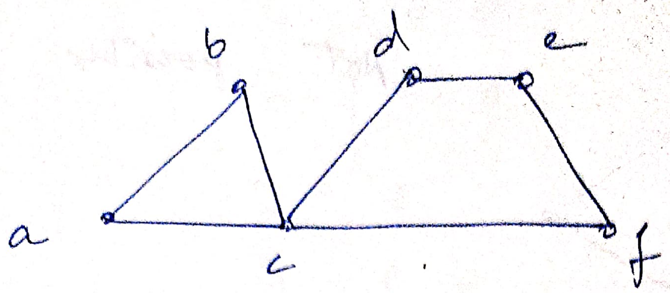


(2) Complete and complete Bipartite



(3) Graph with 6 vertices which is Eulerian But not Hamiltonian.

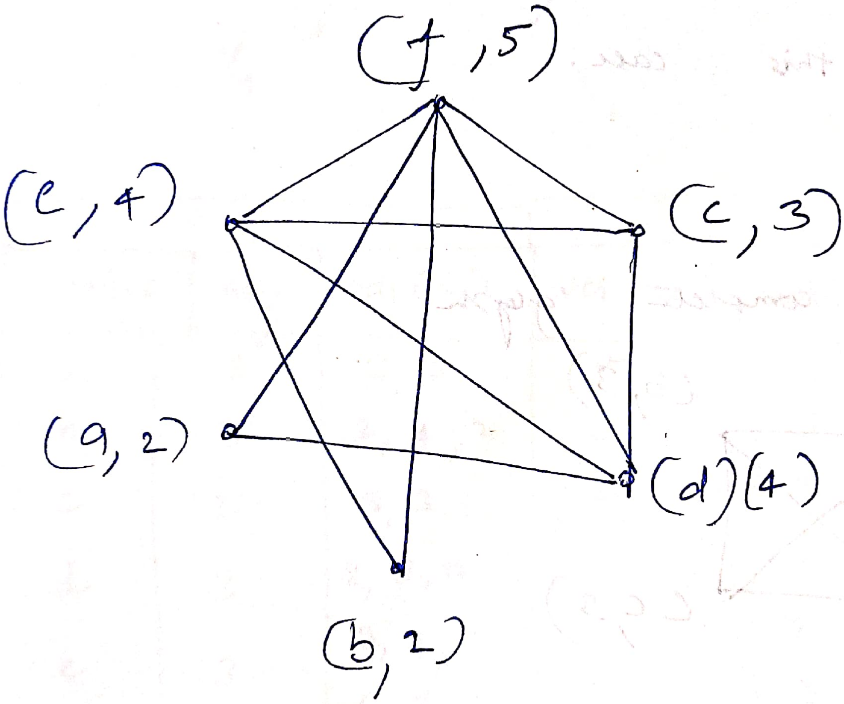
(3)



→ Eulerian But Not Hamiltonian. You would repeat edge (c) to loop to (a)

(4) 6 vertices —

~~2, 2~~ 2, 2, 3, 4, 4, 5



(5) graph G' which is complement of graph G is which deg of every vertex = 2.