3/11/22

DMGT – Tut – 6

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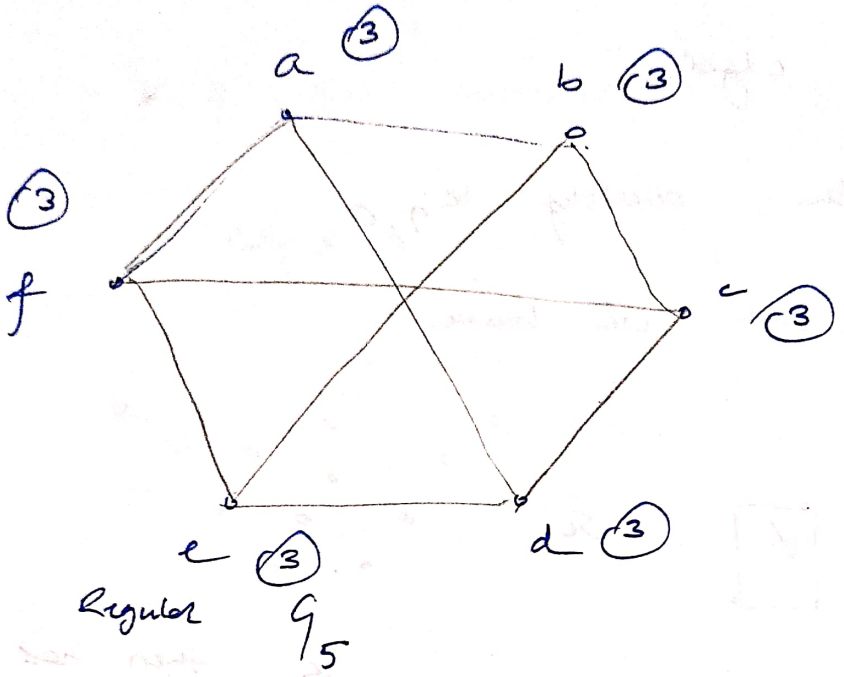
Q.1. K_9 = complete graph

$$\text{edges} = \frac{n(n-1)}{2} = \frac{72}{2} = 36$$

$$K_{5,8} = 5 \times 8 = 40$$

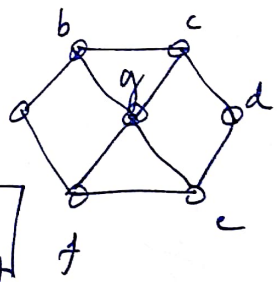
Q.2. Draw a graph which is regular of degree 3. ($n > 5$)

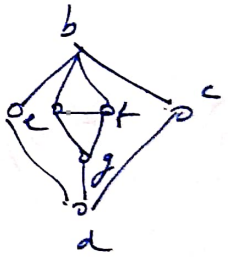


Regular G_5

Q.3. Which graphs are isomorphic ?

→ Checking G_1 and G_2





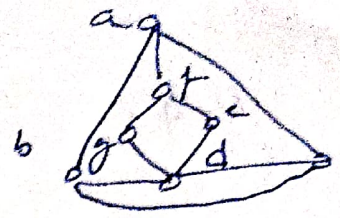
G_1			G_2		
ver	deg	G adj deg	ver	deg	adj
a	2	3, 3	a	2	4, 3
b	3	2, 4, 3	b	4	2, 3, 3, 2
c	3	3, 4, 2	c	2	4, 3
d	2	3, 3	d	3	2, 3, 2
e	3	2, 4, 3	e	3	4, 3, 3
f	3	2, 4, 3	f	3	4, 3, 3
g	4	3, 3, 3, 3	g	3	3, 3, 3

} Their vertices don't match

So G_1 not isomorphic to G_2

≠ sum

Checking G_1 & G_3



G_1			G_3		
ver	deg	adj	ver	deg	adj
a	2	3,3	a	3	3,3,3
b	3	2,4,3	b	3	3,4,3
c	3	3,4,2	c	3	4,3,3
d	2	3,3	d	4	3,3,2,2
e	3	3,4,3	e	2	3,4
f	3	2,4,2	f	3	3,2,2
g	4	3,3,3,3	g	2	3,4

→ does not match

So not matching

not Isomorphic

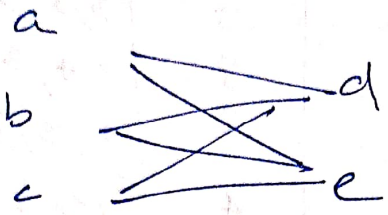
Checking G_2 & G_3

G_2			G_3		
ver	deg	adj	ver	deg	adj
a	2	4,3	a	3	3,3,3
b	4	2,3,3,2	b	3	3,4,3
c	2	4,3	c	3	4,3,3
d	3	2,3,2	d	4	3,3,2,2
e	3	4,3,3	e	2	3,4
f	3	4,3,3	f	3	3,4,2
g	3	3,3,3	g	2	3,4

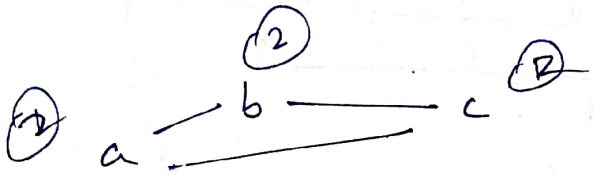
Match

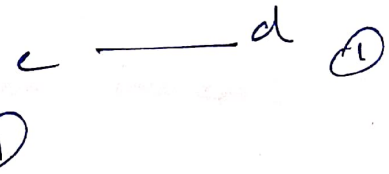
So G_1 and G_3 are Isomorphic

Q.4. $K_{3,2}$



Complement would be

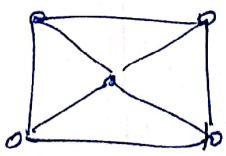




$c = d = 1$

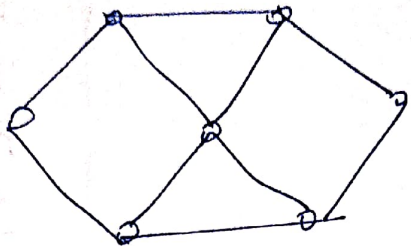
as degree of ~~b = 2~~, it is not a regular graph.

Q. 6. (i)

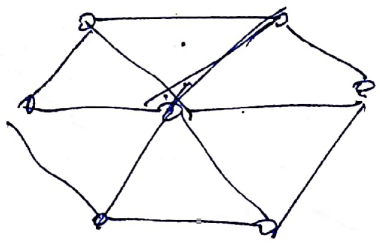


(ii) $K(G) = 3$; $\lambda(G) = 4$

(iii) Both Hamiltonian & Eulerian



(iv) Planar graph with 12 edges & 7 vertices



(v)