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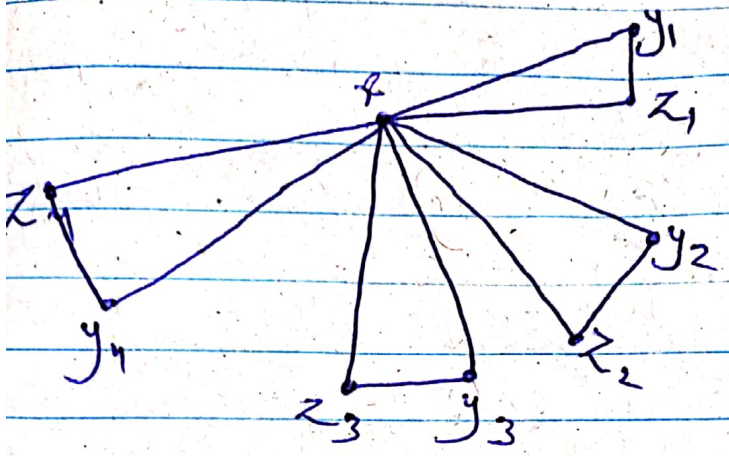
Section:- 5D

Q No1
Ans:-



; x is adjacent to all.

Q No2
Ans:-

→ No of vertices in both graph is 5
→ No of edges in both graph is 7

vertex	u	v	x	w	y
degree	3	3	3	3	2

G_1

vertex	q	r	s	z	t
degree	3	2	3	3	3

G_2

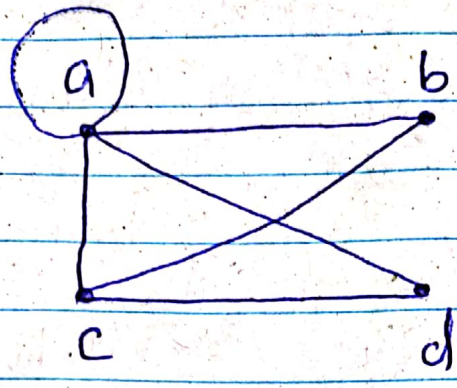
$V(G_1) \longleftrightarrow V(G_2)$
$u \longleftrightarrow q$
$v \longleftrightarrow s$
$y \longleftrightarrow r$
$w \longleftrightarrow t$
$x \longleftrightarrow z$

Edges
$uv \longleftrightarrow qs$
$ux \longleftrightarrow qz$
$uw \longleftrightarrow qt$
⋮

Hence, given graphs are Isomorphic

Q NO3

Ans:-



Q NO4

Ans:-

No of vertices in both graph is 10

No of edges in both graph is 9.

vertex	1	2	3	4	5	6	7	8	9	10
degree	1	1	4	1	1	4	2	1	2	1

e_1

vertex	a	b	c	d	e	f	g	h	i	j
degree	1	1	4	1	2	2	1	4	1	1

e_2

Note that first they have same no of vertices and Edges with two vertex of each graph of degree 4 and 2, and remaining 6 of degree 1.

→ We know corresponding vertices must have the same degree.

So the vertices of degree 4 in G_1, (3 and 6) must map to the vertices of degree 4 in G_2 (c and h)

However, in G_1, the degree 4 vertices (3 and 6) are adjacent. whereas in G_2, the degree 4 vertices (c and h) are not adjacent.

$\Rightarrow$ Hence, G_1 and G_2 are non-isomorphi

Q NO5

Ans:- Let, the no of vertices is,

$$x + y = 20 \longrightarrow (1)$$

According to handshaking lemma, the sums of the degrees is twice of the no of edges.

$$3x + 7y = 124 \longrightarrow (2)$$

from eq(1), we get

$$y = -x + 20$$

$$3x - 7x + 140 = 124$$

$$-4x = -16$$

$$\boxed{x = 4}$$

$$\boxed{y = 16}$$

" There will be four(4) vertices with degree 3"

Q No 6

Ans:- As we know, Sum of degree in graph must be even, (because it is equal to twice the number of its edges). Hence, there is no 3-regular graph on 7 vertices because its degree sum would be,

$$3(7) = 21$$

that is not Even.

Q No 7

Ans:. 6, 5, 4, 4, 3, 2.

the first number is 6 and after that we have only 5 numbers so we need 6 numbers to do subtract (−1) from them.

Hence,

It is not graphical.

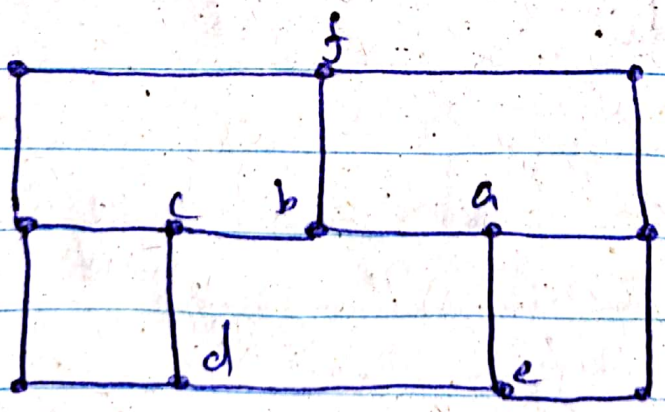
Q#08

Ans:-

It does not Exist

We know that, degree of all vertices either all even, or have exactly 2 odd, for every wall(edge) be covered (means eulerian circuit or path). But we have more than 2 odd vertices. that are highlighted below in the Diagram hence,

The requested Curve does not exist.



vertices a, b, c, d, e, f have 3 degrees.

Q NO9

Ans:-

first graph is Hamiltonian by the theorem of Dirac

if $n \geq 3$

$\deg(v) \geq n/2$

Then,

Graph has Hamiltonian Cycle.

- Both graph have 11 vertices
- And degree of each vertex of 1st graph is greater than $n/2$.
- And also the degree of some vertex of 2nd graph is less than $n/2$.