

CS & IT ENGINEERING

Graph Theory

Discrete Mathematics



DPP 04

Discussion notes



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TOPICS TO BE COVERED

01 Question

02 Discussion

Q.1

If a hypercube (Q_n) is given with edges 193, then the number of vertices will be

P
W

$$e = 193$$

[MCQ]

A. 6

B. 5

C. 7

D. None of these

$$\text{no. of edges} = n \cdot 2^{n-1}$$

$$\rightarrow n = 5$$

$$5 \cdot 2^5$$

$$193 = n \cdot 2^{n-1}$$

$$n = 6$$

$$6 \cdot 2^6$$

$$193 = \frac{n \cdot 2^n}{2}$$

$$n = 7$$

$$7 \cdot 2^7$$

$$386 = n \cdot 2^n$$

Q.2

consider the following statements:

S₁: Every hypercube graph is a bipartite graph. (τ)

S₂: Every bipartite graph is also a hypercube.

[MCQ]

Which of the following options is True?

- A. S₁ only ✓
- B. S₂ only
- C. Both S₁ and S₂
- D. Neither S₁ nor S₂



Q.3

P
W

A certain graph G has order 16 and size 29. The degree of each vertex of G is 3, 4 or 5. There are six vertices of degree 4. How many vertices of G having degree 5?

$$n = 16 \quad e = 29$$

[NAT]



$$3(10 - n) + 4 \times 6 + 5n = 2 \cdot 29$$

$$30 - 3n + 24 + 5n = 58$$

$$2n = 58 - 54$$

$$2n = 4$$

$$n = 2$$

Q.4

If the sequence $x, 7, 7, 5, 5, 4, 3, 2$ is graphical then what are the possible value of x ($0 \leq x \leq 4$)?

P
W

[MCQ]

- A. 0
- B. 2
- C. 3
- D. 1



$\underline{x}, \textcircled{7}, \textcircled{7}, \textcircled{5}, \textcircled{5}, \textcircled{4}, \textcircled{3}, 2$



$n=1$



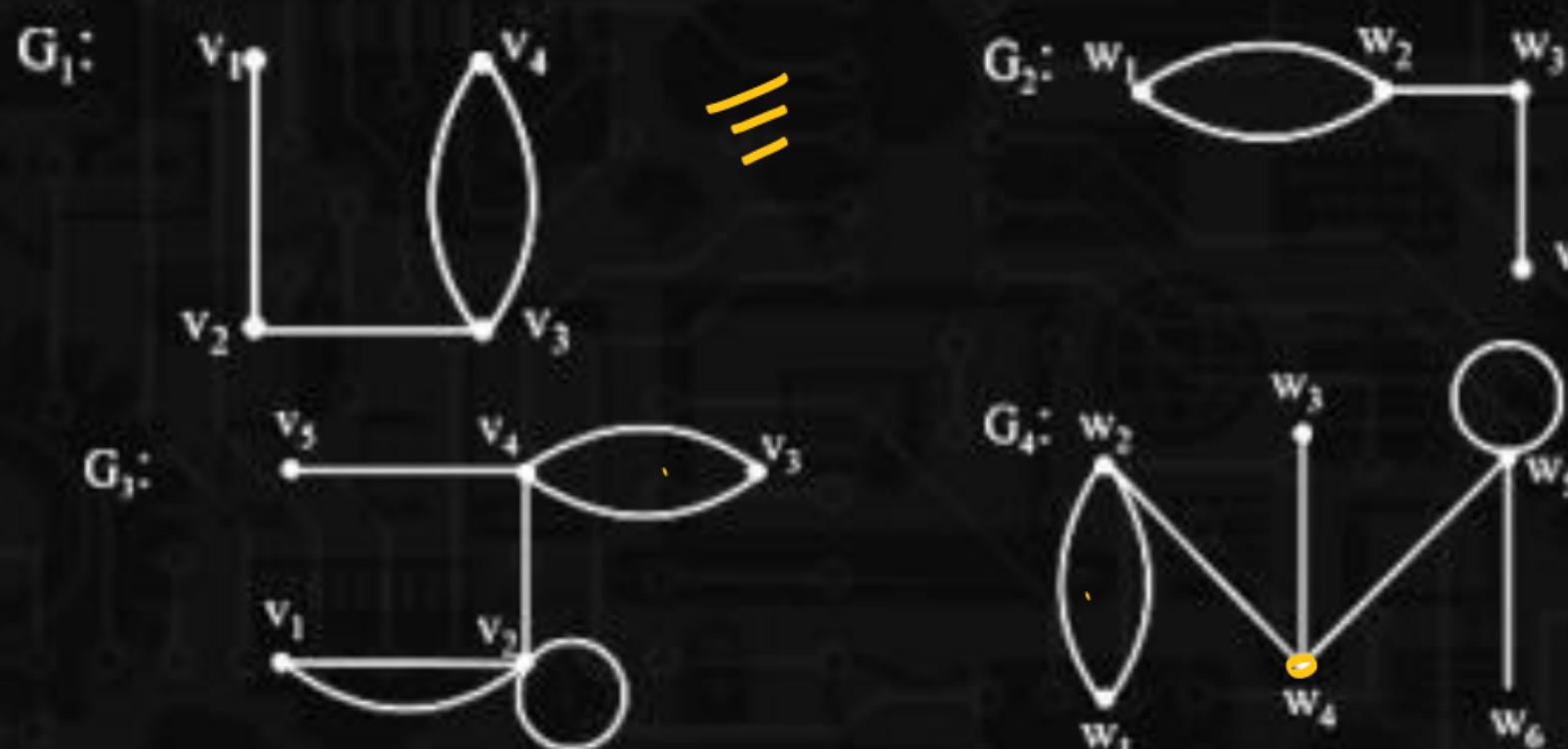
$\underline{7}, \underline{7}, 5, 5, 4, 3, 2, 1$



Q.5

Which of the following graphs are isomorphic graph?

[MSQ]



- A. G_1 and G_2 are isomorphic ✓ (a,d)
- B. G_3 and G_4 are isomorphic
- C. G_1 and G_2 are not isomorphic
- D. G_3 and G_4 are not isomorphic ✓

