CS & IT ENGINEERING

Graph Theory

Discrete Mathematics

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DPP 08 Discussion Notes

01 Question

02 Discussion

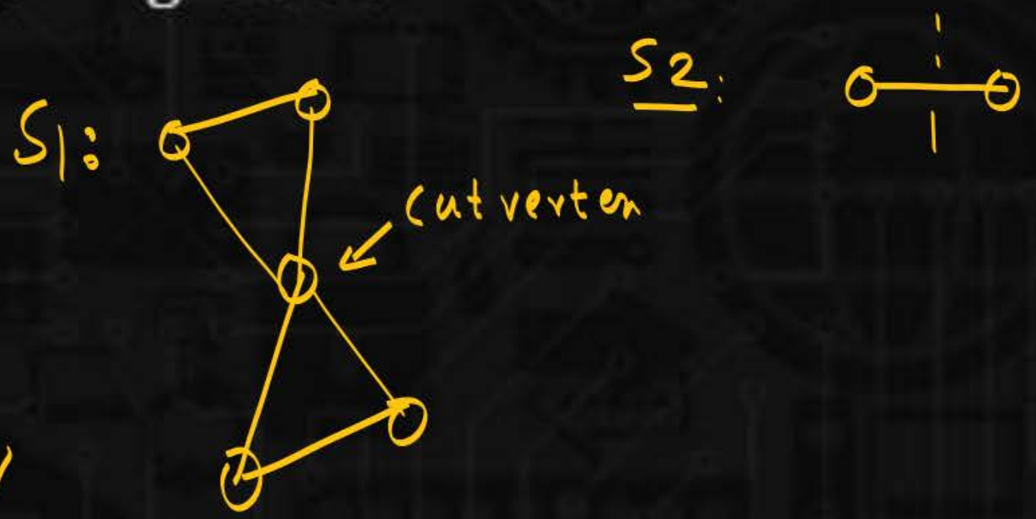
Q.1 [MCQ]

Consider the following statements:

S_1: If a connected graph G has a cut vertex, then G has a cut edge. (false)

S_2: If a connected graph G has a cut edge then G has a cut vertex. (false)

Which of the following is true?



A. S_1 only

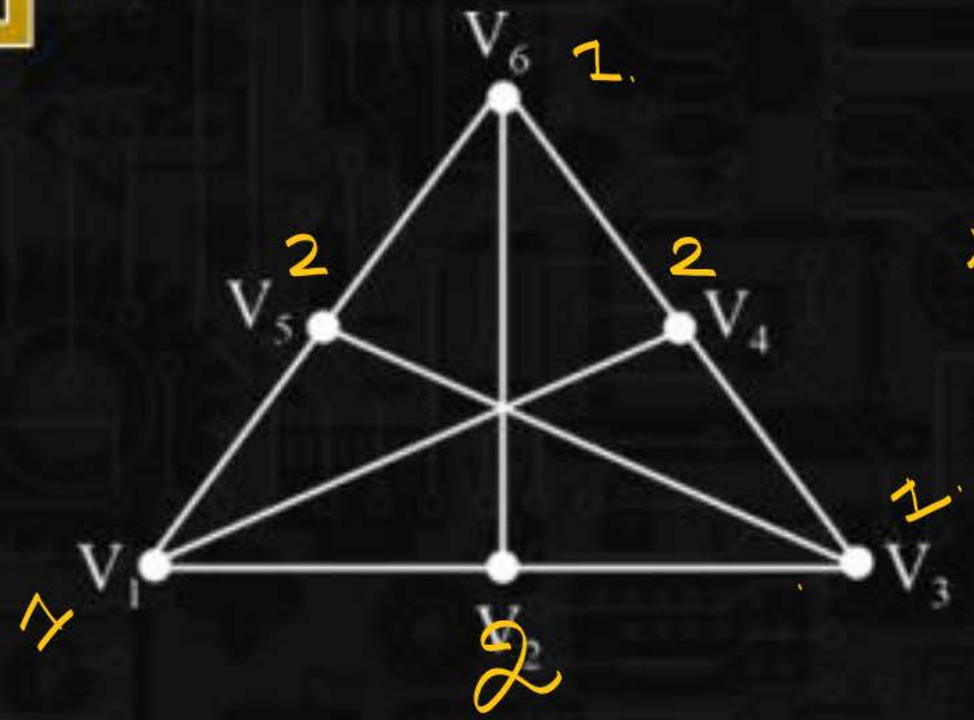
B. S_2 only

C. Both S_1 and S_2

D. Neither S_1 nor S_2 ✓

Q.2 For the graph shown below, the chromatic number is 2.

[NAT]



$\chi(G) = 2$

Q.3

If G is a connected graph with 10 vertices and vertex connectivity is 3, then minimum number of edges necessary in G is 15.

[NAT]

$n = 10 \quad k(G) = 3.$

$$k(G) \leq \frac{2e}{n}$$

$$3 \leq \frac{2 \cdot e}{10}$$

$$30 \leq 2e$$

$$15 \leq e$$

Q.4 Which of the following options is/are correct? [MSQ]

A. The chromatic number of a graph with at least 1 edge is at least 2. (T)

B. A graph is null graph if and only if its chromatic number is 2. (false)

C. For any graph, $K_G \leq 1+\Delta(G) \leq n$ where $\Delta(G)$ is maximum degree and K_G is chromatic number. (T)

$\chi(G) \leq 1+\Delta(G) \leq n$

$3 \leq 1+2 \leq 3$

D. The chromatic number of a multi graph is equal to its equivalent simple graph chromatic number. (T)

Q.5

[MCQ]

Consider the following statements:

S_1: A graph is bipartite graph if and only if its chromatic number is 2. (T)

S_2: The chromatic number of a tree is 2. Thus, every tree is bipartite graph. (T)

Which of the following statement is False?

A. S_1 only

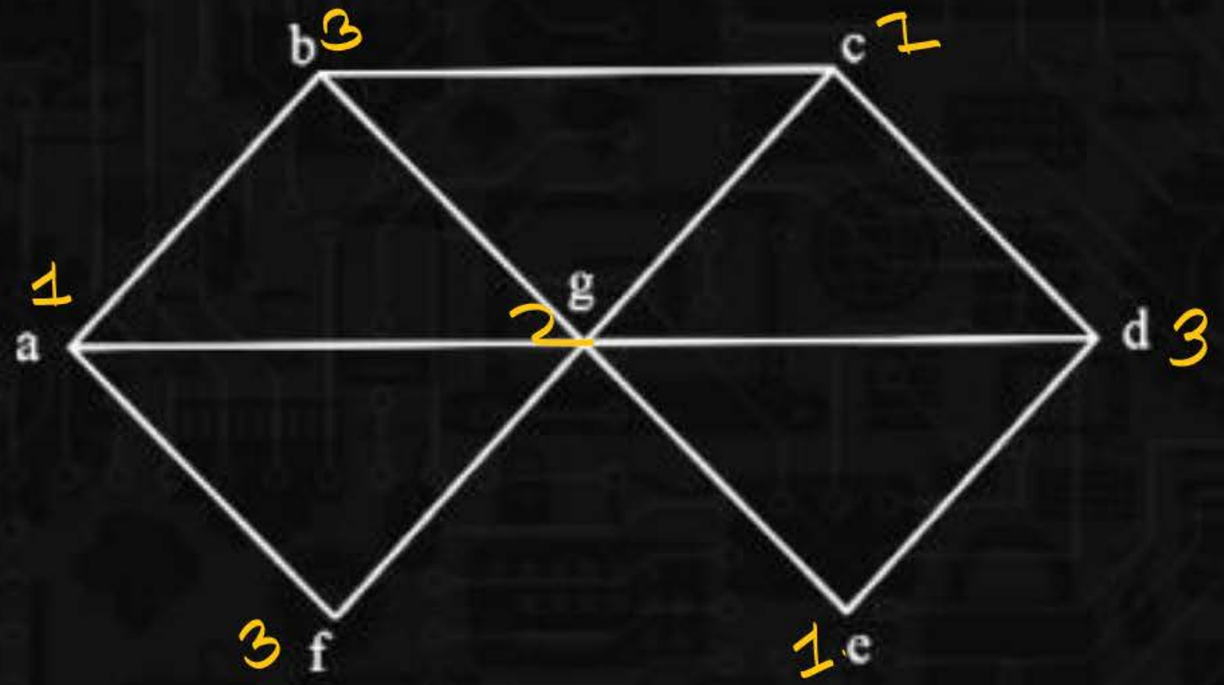
B. S_2 only

C. Both S_1 and S_2

D. Neither S_1 nor S_2 ✓

Q.6

What is the chromatic number of the given graph?



[NAT]

$\chi(G) = 3$


THANK YOU GW
SOLDIERS !