



# CS & IT ENGINEERING

## Graph Theory

DPP 09

Discussion Notes

[NAT]

1. If  $G$  is a bipartite graph with 6 vertices and 9 edges then the chromatic number of  $\bar{G} = \cancel{3}$ .

$$n = 6 \quad e = 9 \quad 9 \quad + \quad e(\bar{G}) = \frac{6 \times 5}{2} = 15$$

 $K_{3,3}$ 

$$\chi(\bar{G}) = 3$$

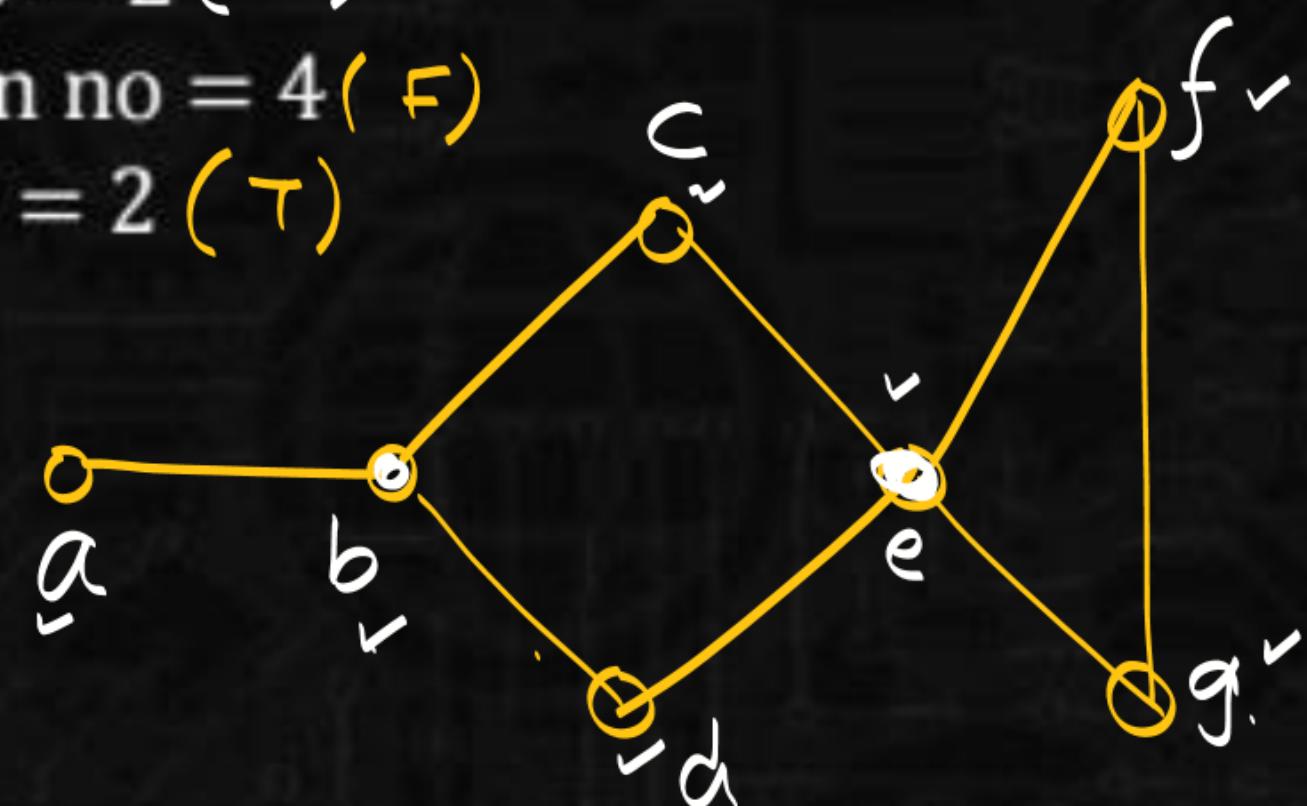
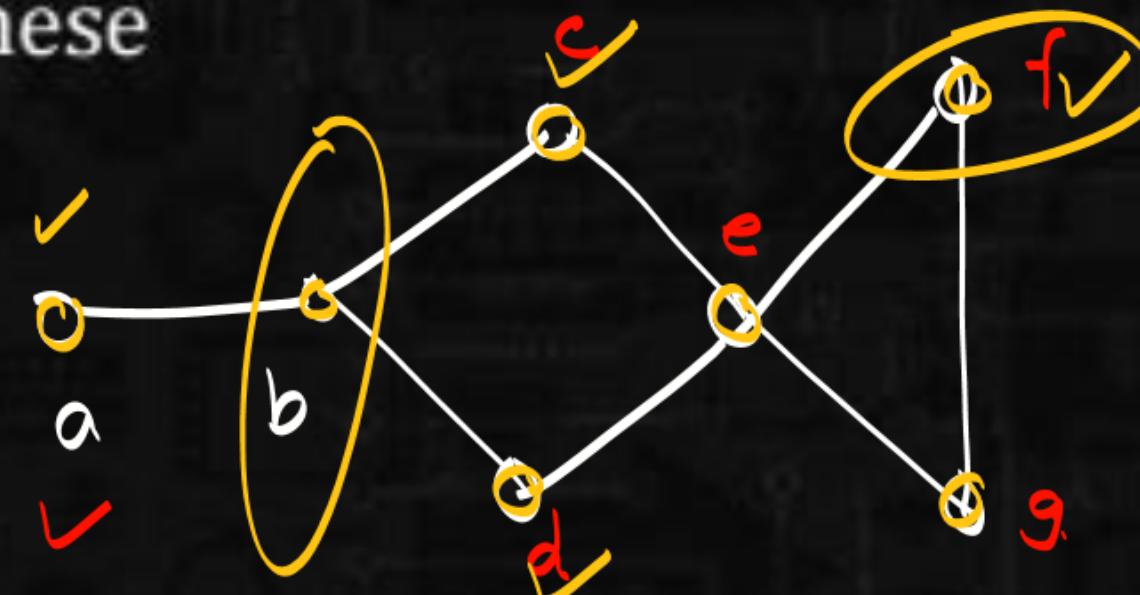
[MSQ]

2. Consider the graph shown below.

(b, c)

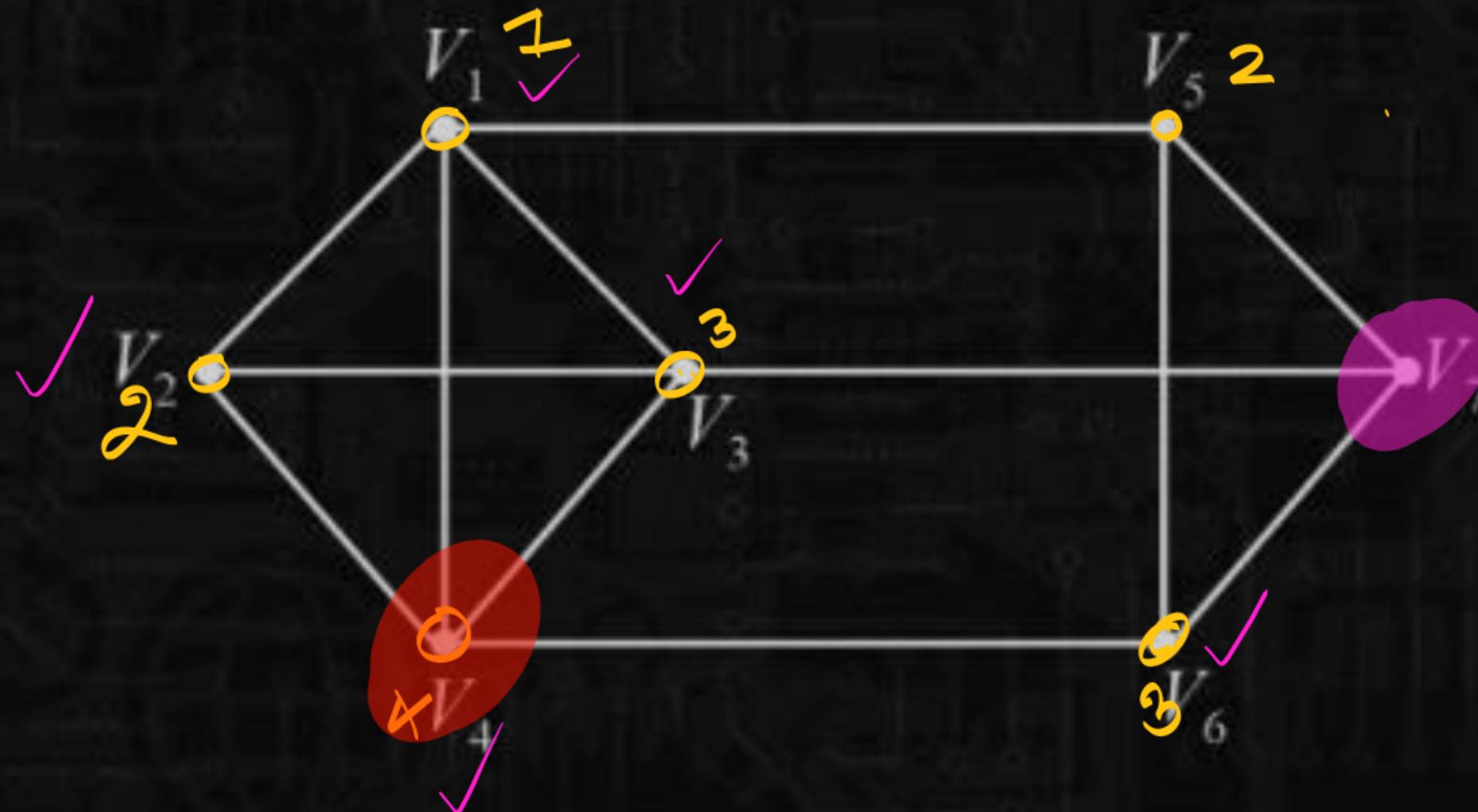
Which of the following option is correct?

- (a) Dominating set =  $\{e, b\}$  and Domination no = 2 ( $\text{F}$ )
- (b) Dominating set =  $\{a, c, d, f\}$  and Domination no = 4 ( $\text{F}$ )
- (c) Dominating set =  $\{b, f\}$  and Domination no = 2 ( $\text{T}$ )
- (d) None of these



[NAT]

3. For the graph shown below.

Assume  $x$  is the chromatic number of the graph and  $y$  is the domination number then find  $x + y$ ?

$$\begin{aligned}x &\rightarrow \text{chromatic no.} \\&= 4 + 2 \\&= \underline{\underline{6}}\end{aligned}$$

$$\begin{aligned}y &\rightarrow \text{domination no.} \\&= 2 \\y &= 2\end{aligned}$$

[MSQ]

(b,c,d)

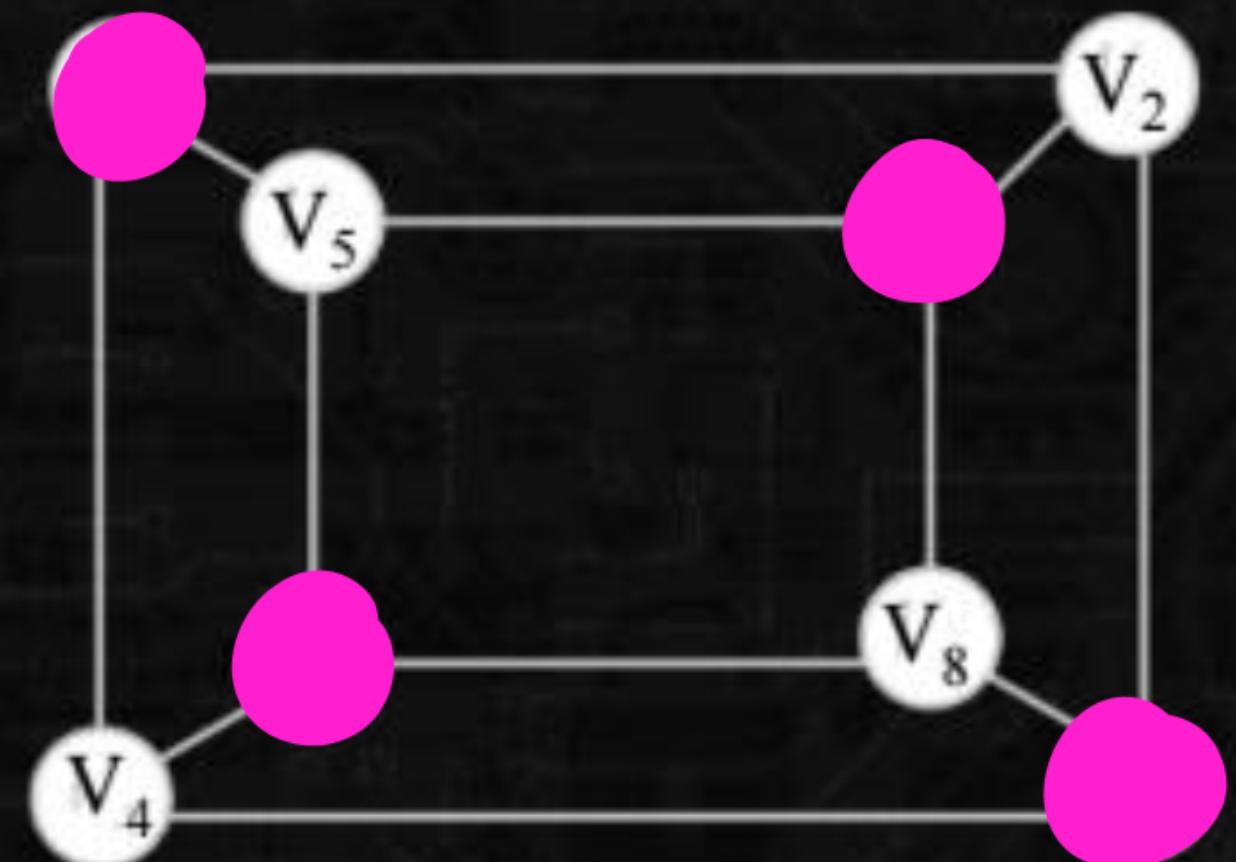
4. Which of the following is/are a independent set for the graph shown below?

(a)  $\{V_1, V_8, V_2\}$  ✗

(b)  $\{V_1, V_8\}$  ✓

(c)  $\{V_2, V_4, V_5, V_8\}$  ✓

(d)  $\{V_1, V_3, V_6, V_7\}$  ✓



Independent set  
set of non adjacent vertices.

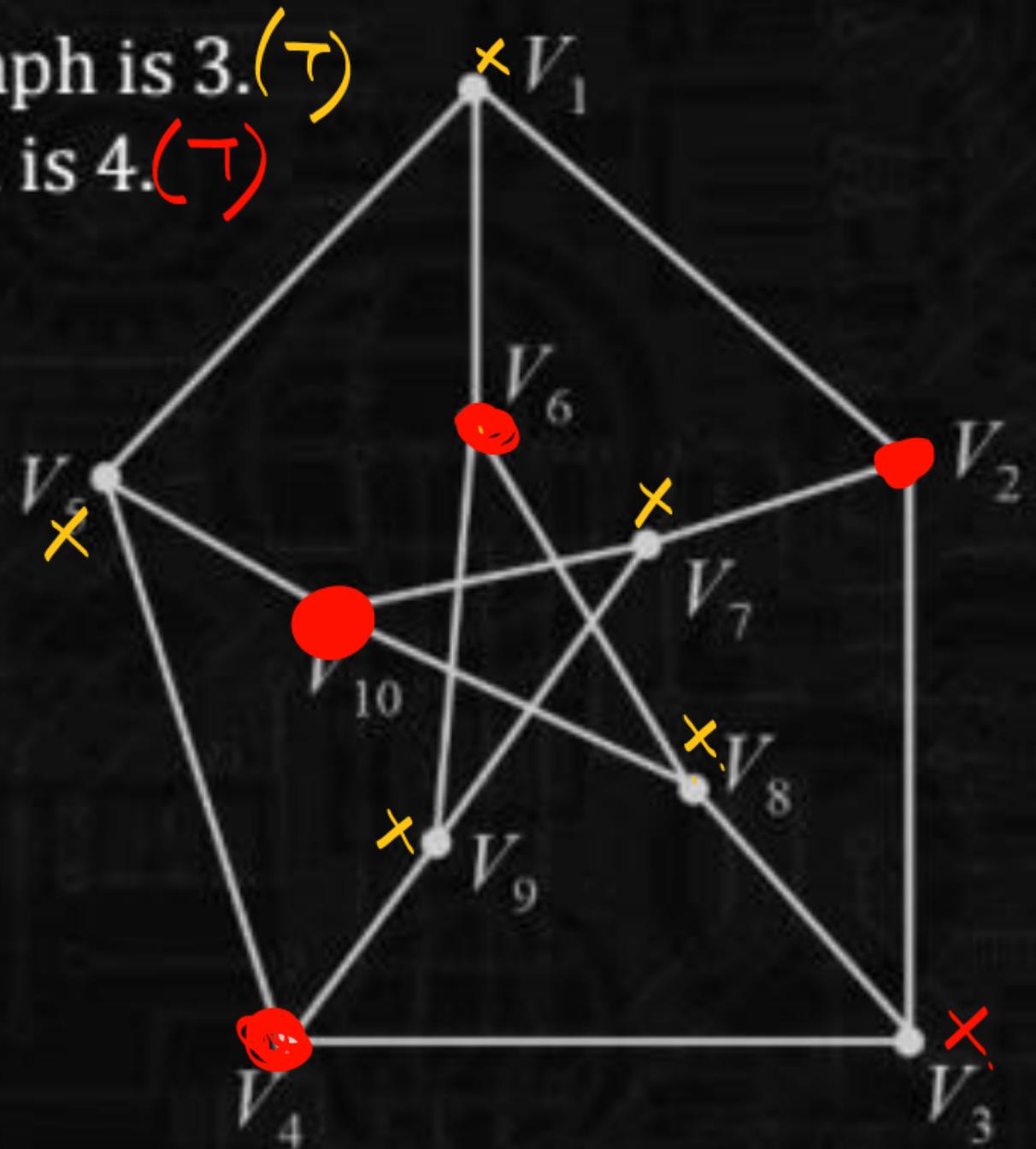
[MCQ]

5. Consider the given graph G.

Which of the following option is correct ?

 $S_1$  : The chromatic number for the given graph is 3. (✓) $S_2$  : The independence number of the graph is 4. (✗)

- (a)  $S_1$  only
- (b)  $S_2$  only
- (c)  $S_1$  and  $S_2$  both ✓
- (d) Neither  $S_1$  nor  $S_2$



[NAT]

6. For the graph shown below, the chromatic number is   .

