CS & IT ENGINEERING

Graph Theory

DPP 12

Discussion Notes

[MCQ]

1. Consider a planar graph G with vertices are 20 and number of edges are 25. The graph G have 8 closed faces then find the number of Components?

(a) 1
(b) 2
(c) 3
(d) 4

$n = 20 \quad e = 25 \quad f = 8 + 1$

$= 9.$

$n - e + f = k + 1.$

$20 - 25 + 9 = k + 1.$

$-5 + 9 = k + 1.$

$4 = k + 1$

$k = 3.$

[MCQ]

2. Consider the following statements

S_1 : k_n is planar if and only if $n \leq 4$. (T)

S_2 : $k_{m,n}$ is non-planar if and only if $m \geq 3$ or $n \geq 3$. (false)

Which of the following is False?

(a) Only S_1

(b) Only S_2 ✓

(c) Both S_1 and S_2

(d) Neither S_1 nor S_2

$T \vee F$

$K_{m,n}$

$m = 3 \quad n = 1$

$K_{3,1}$

[NAT]

3. Consider the graph G shown below.
Find the total number of edges that need to delete to make the above G planar?

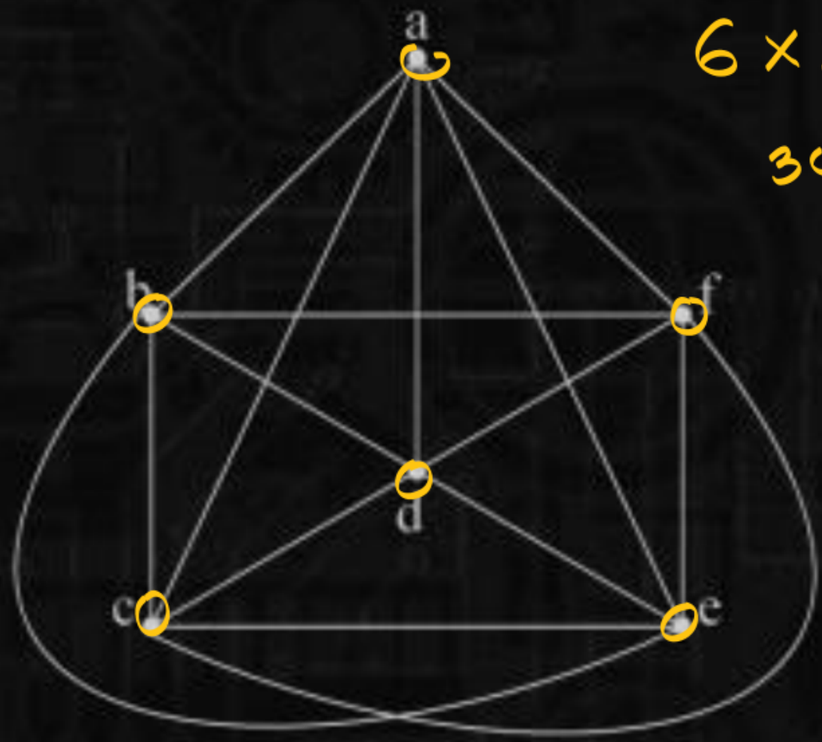
Ans : 3

Planar → $e \leq 3n-6$.

$e \leq 3(6)-6$.

$e \leq 18-6$.

$e \leq 12$.



$6 \times 5 = 2e$

$30 = 2e$

$e = 15$

[MCQ]

4. Consider a connected simple planar graph with order 10. Find the minno number of edges such that the minimum degree of graph must be 4?

(a) 24
(b) 20 ✓
(c) 18
(d) 16

$n = 10$

$\delta(G) = 4$

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

$4 \leq \frac{2(e)}{10}$

$20 \leq e$

$e \leq 3(n) - 6$

$e \leq 3(10) - 6$

$e \leq 24$

$(20 \cdots 24)$

[NAT]

5. If a 3 – regular graph with number of edges 15. How many closed faces are there in connected planar graph?

$e = 15$

$n - e + f = 2$

$10 - 15 + f = 2$

$-5 + f = 2$

$f = 7$

Closed $\longrightarrow$ 6

$n \cdot 3 = 2e$

$n \cdot 3 = 2 \times 15$

$n = 10$


THANK YOU GW
SOLDIERS !