CS & IT ENGINEERING

Graph Theory

Discrete Mathematics

DPP 05

Discussion Notes

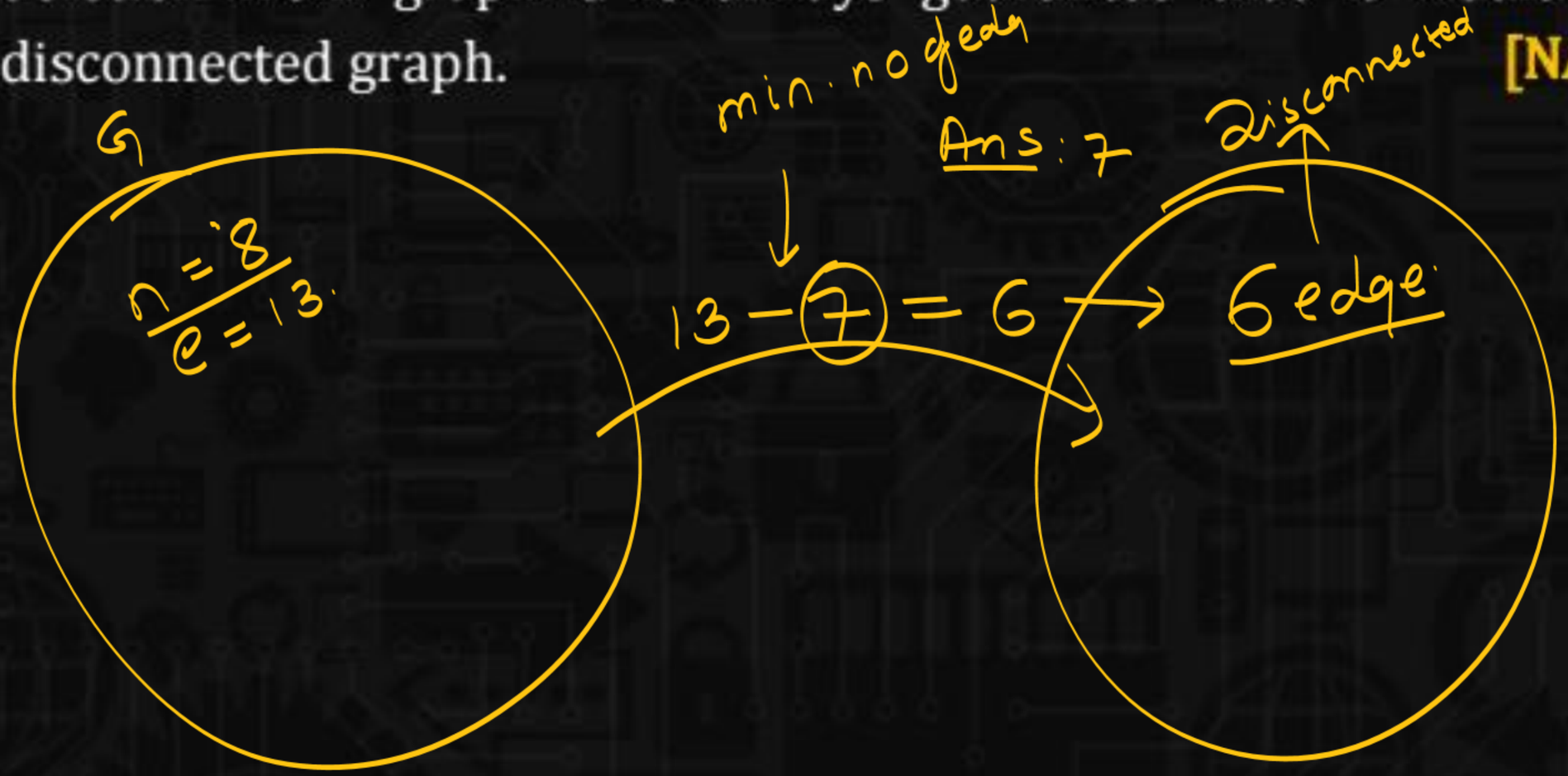
SATISH YADAV SIR

01 Question

02 Discussion

Q.1

Consider an undirected graph G, which is connected and have 8 vertices and 13 edges. Find the minimum number edges, whose deletion from graph G is always guarantee that it would be disconnected graph. **[NAT]**



Q.2 The order (Number of vertices) of a complete bipartite graph in which there are 162 edges and one of the partitions has twice the number of vertices as of other ___? [MCQ]

A. 20

B. 25

C. 27 ✓

D. 29

$e = 162.$

$e(K_{n, 2n}) = 162$

$V = V_1 + V_2.$

$= n + 2n$

$= 3n$

$= 3 \times 9 = 27$

$n \times 2n = 162$

$2n^2 = 162$

$n^2 = 81$

$n = 9$

Q.3 Consider a simple graph of 10 vertices. If the graph is disconnected, then the maximum number of edges, it can have is _____? [NAT]

$n = 10$

$e = (n-k)(n-k+1)/2$.

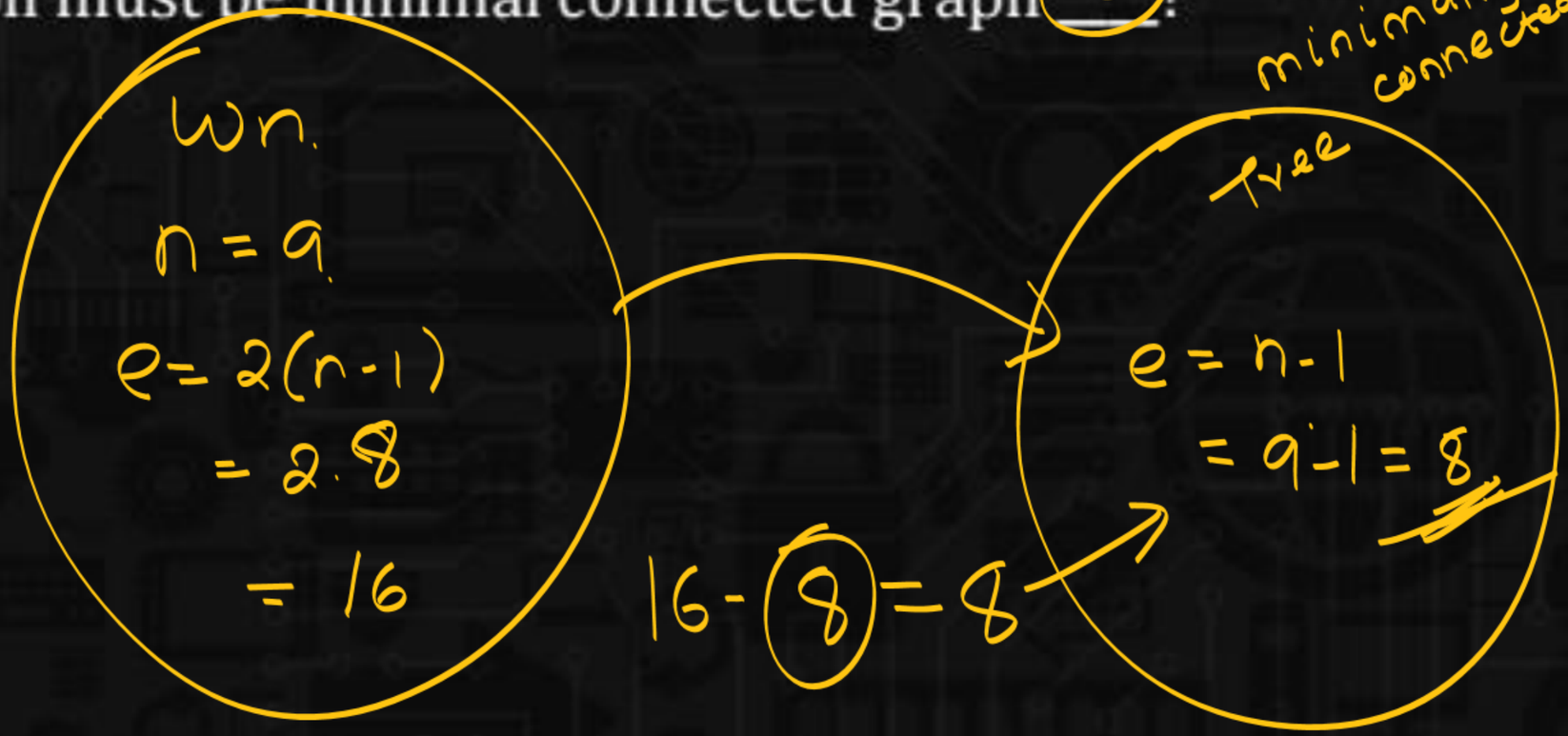
$k = 2 \quad k = 3 \quad k = 4$.

$e = (10-2)(10-2+1)/2$.

$= 8 \cdot 9/2 = \underline{36 \text{ edges}}$.

Q.4

Consider a wheel graph (W_n) of 9 vertices. Find the number of edges to be deleted from the above graph such that the resultant graph must be minimal connected graph ___8___? **[NAT]**



Q.5 If G is a simple disconnected graph with 16 vertices and 3 components, then maximum number of edges possible in G is _____?

[MCQ]

A. 90

B. 91 ✓

C. 92

D. 93

$e = (n-k)(n-k+1)/2$

$= \frac{13 \cdot 14}{2} \times 7 = 13 \times 7$

$(10+3) \times 7$

$= 70 + 21$

$= 91.$

Q.6

Which of the following statements is/are true?

S_1: A graph $G(V, E)$ is called tree if there is an exactly one path between every 2 vertices.

S_2: A graph $G(V, E)$ is tree iff it is connected, and it does not contain cycle.

[MCQ]

A. S_1 only

B. S_2 only

C. Both S_1 and S_2 ✓

D. None of these


THANK YOU GW
SOLDIERS !