CS & IT ENGINEERING

Graph Theory

Discrete Mathematics

DPP 07

Discussion notes

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01 Question

02 Discussion

Q.1 If G is a bipartite graph with 9 vertices and maximum number of edges, then vertex connectivity of G = 4. **[NAT]**

$K_{4,5}$ OR $K_{5,4}$

$$K(K_{m,n}) = \min(m,n)$$

$$K(K_{4,5}) = \min(4,5) = 4$$

Q.2 Which of the following options is/are correct?

(a, d)

[MSQ]

A. A graph G is Euler iff it is connected and $\forall v \in G$ degree (v) = even. (T)

B. A K – regular graph is Euler iff K is even (F)

C. A wheel graph (w_n) can have Euler circuit. (F)

D. A graph will contain an Euler path if it contains at most two vertices of odd degree. (T)

Q.3

A forest is disconnected graph in which each component is a tree. Let F be a forest on 80 vertices with 21 connected components. Then number of edges in G is ____. [MCQ]

A. 58

B. 60

C. 59 ✓

D. 101

$n = 80 \quad k = 21$

$e = n - k$

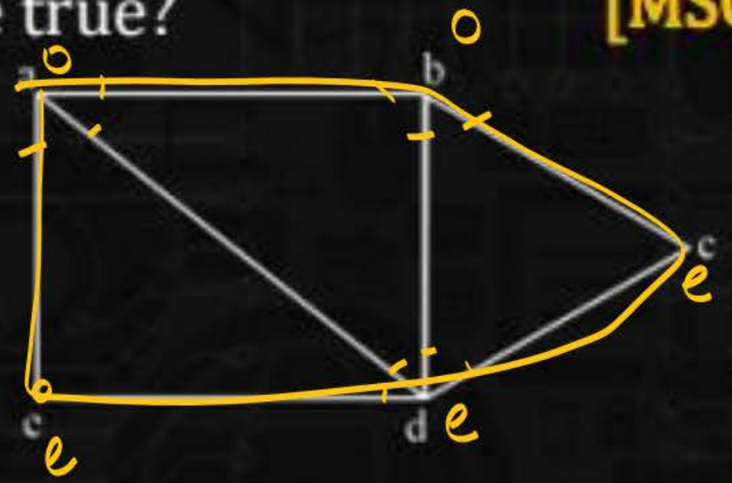
$= 80 - 21$

$= 59$

Q.4

For the graph shown below

Which of the following statements is/are true? [MSQ]



S_1 : Euler path exists (T)

S_2 : Euler circuit exists (F)

S_3 : Hamiltonian cycle exists (T)

S_4 : Hamiltonian path exists (T)

A. S_1, S_3 and S_4 ✓

B. S_1, S_2 and S_3

C. S_1, S_2 and S_4

D. S_2, S_3 and S_4

Q.5 Which of the following is Euler Graph?

[MCQ]

A. K_{51} 50, 50, 50 ..... 50 (E.G) ✓

B. K_{50} 49, 49, 49 ..... (False)

C. $\overline{C_{60}}$ (false)

D. 11 – regular 11, 11, 11 ..... (false)

K_{60} 59 59 59 ..

C_{60} 2, 2, 2, 2 .....

$\overline{C_{60}}$ 57 57 57 .....

Q.6 If G is not a simple connected graph with n vertices then maximum number of edges possible in G is ___.

[MCQ]

A. $\frac{n(n-2)}{2}$

B. $\frac{(n-1)n}{2}$

C. $\frac{(n-1)(n-2)}{2}$ ✓

D. $\frac{(n-1)(n-2)}{4}$

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

$k = 2$

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

$= (n-2)(n-1)/2.$

THANK YOU GW
SOLDIERS !