2K17/MC/087
Sachin Duhan

Bunk Pages - The Social Notebook

GRAPH THEORY - SURPRISE TEST

Q-3

no. of vertices = n
and no. of edges = m

Suppose that u and v are any two vertices of G that are not adjacent.

We write deg(u)
So; we assume that
let, H be hamitonian graph with any edges that have v or u as end vertices of the graph
The H has $n-2$ vertices and $m - \deg(u) - \deg(v)$

i.e. $(n-2)$ = vertices = $m - \deg(u) - \deg(v)$

The max no. of edges that H can have is

$$^{n-2}C_2 = \frac{(n-2)(n-3)}{2}$$

$$\text{or } \frac{1}{2}(n^2 - 5n + 6)$$

and when $m - \deg(u) - \deg(v) \leq \frac{1}{2}(n-2)(n-$
So;
$$\deg(u) + \deg(v) \geq m - \frac{1}{2}(n^2 - 5n + 6)$$

again $\Rightarrow$ $\deg(u) + \deg(x) \geq m - \frac{1}{2}(n^2 - 5n + 6)$

By the hypothesis theorem

$\deg(u) + \deg(v) \geq \frac{1}{2}(n^2 - 3n + 6) - \frac{1}{2}(n^2 - 5n + 6)$

$= n$

Hence proved

Conclusion

Hence we can say that for $m \geq n^2 - \frac{3n + 6}{2}$

we can infer that the given graph with given condition is a hamiltonian graph