Discrete Mathematics

Graph Theory

DPP: 1

Q1 How many simple graphs are possible with 5 vertices and 3 edges?

Q2 A non-directed graph contains 16 edges and all vertices are of degree 2.
Then number of vertices in G is _____.

Q3 G is an undirected graph with n vertices and 25 edges such that each vertex of G has degree atmost 4. Then minimum possible value of n is _____.

Q4 G is an undirected graph with n vertices and 35 edges such that each vertex of G has degree at least 3. Then maximum possible value of n is _____.

Q5 If G be a graph with 5 vertices and 7 edges then
(A) $\delta > (G)\ 2$
(B) $\Delta > (G)\ 4$
(C) $\delta \leq (G)\ 2$
(D) $\Delta \leq (G)\ 2$

Q6 Find the number of edges of an undirected graph having degree sequence 2, 4, 4, 3, 4, 1?

Q7 An ordered n-tuple (d1, d2, d3, ...,dn) with d1 ≥ d2 ≥ d3.....≥ dn is called graphic if three exists a simple undirected graph with n vertices having degrees d1, d2, d3, ...,dn respectively.
Which of the following is a graphic sequence?
(A) 5, 3, 3, 2, 2, 1
(B) 2, 1, 1, 1, 1, 1
(C) 6, 5, 4, 3, 2, 1
(D) 5, 5, 2, 2, 1, 1

Q8 There are 24 routers in an organization. Find the number of cables required to connect them such that each router is connected with exactly 6 other routers.

Q9 Consider a complete graph with size 2016. Suppose after deletion of 2 vertices from the above graph, the modified graph have x number of edges and y number of vertices.
Find the value of x – y ?

Q10 The degree sequences of a simple graph is the sequence of the degree of the nodes in the graph in decreasing order. Which of the following sequences cannot be the degree sequence of any graph?
I. 7,6,5,4,4,3,2,1
II. 6,6,6,6,3,3,2,2
III. 7,6,6,4,4,3,2,2
IV. 8,7,7,6,4,2,1,1
(A) I and II
(B) III and IV
(C) IV only
(D) II and IV

Answer Key

Q1	120~120
Q2	16~16
Q3	13~13
Q4	23~23
Q5	(C)
Q6	9~9
Q7	(A)
Q8	72~72
Q9	1829~1829
Q10	(D)