

Quiz-I: Algorithmic Graph Theory (AGT)

1st Sem, M.Tech (CSE & CSEIS) and Research Scholar dated 6/09/2021 at 2.00 PM

Instructions: Answer all questions. Full Marks 26, Time 30 Minutes

The respondent's email (**21mt0214@cse.iitism.ac.in**) was recorded on submission of this form.

Name *

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Admission No. *

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Attempt all questions

each questions carry two marks

A connected planar graph having 6 vertices, 7 edges contains _____ regions.

☐ 15

☒ 3

☐ 1

☐ 11



A graph has 24 edges and degree of each vertex is k , then which of the following is possible number of vertices?

- ☐ 20
- ☐ 15
- ☐ 10
- ☒ 8

The number of distinct simple graphs with up to three nodes is

- ☐ 15
- ☐ 10
- ☒ 7
- ☐ 9

A graph which contain self loop as well as multi edges is

- ☐ Simple graph
- ☐ Multi graph
- ☐ Digraph
- ☒ Pseudo graph



The maximum number of edges in a n -node undirected graph without self loops is

- ☐ N^2
- ☒ $N * (N - 1) / 2$
- ☐ $N - 1$
- ☐ $(N + 1) * N / 2$

The number of edges in a regular graph of degree d and n vertices is

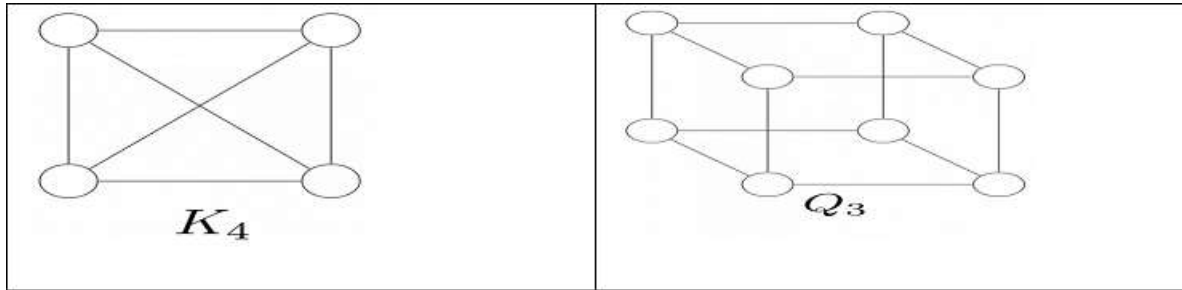
- ☐ $n + d$
- ☐ nd
- ☒ $nd / 2$
- ☐ $n * (n - 1) / 2$

Which of the following statement is/are true? I) Adjacency list representation is better for sparse graph than adjacency matrix representation II) Adding a vertex in adjacency list representation is easier than Adjacency matrix representation III) Finding whether there is an edge between any two nodes in a graph is easier in Adjacency list representation

- ☐ I only
- ☐ I and III only
- ☐ I, II and III
- ☒ I and II only



Which statement is true



- ☐ K_4 is a planar while Q_3 is not
- ☒ Both K_4 and Q_3 are planar
- ☐ Q_3 is planar while K_4 is not
- ☐ Neither K_4 nor Q_3 is planar

A cycle on n vertices is isomorphic to its complement. The value of n is ____.

- ☐ 2
- ☐ 4
- ☐ 6
- ☒ 5

Which of the following problems is similar to that of a Hamiltonian path problem?

- ☐ Knapsack problem
- ☐ Closet pair problem
- ☐ Assignment problem
- ☒ Traveling salesman problem



Let G be a connected planar simple graph with 25 vertices and 60 edges. Find the number of regions in G .

- ☐ 35
- ☒ 37
- ☐ 83
- ☐ 90

Let X be the adjacency matrix of a graph G with no self loops. The entries along the principal diagonal of X are

- ☐ Different
- ☒ all zeroes
- ☐ all ones
- ☐ Infinity

The number of edges in a regular graph of degree 46 and 8 vertices is ____.

- ☐ 347
- ☐ 230
- ☒ 184
- ☐ 186

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