



Graph Assignment - It's a very good course .As it gives knowledge about today's experience of human

Discrete Mathematics (National University of Computer and Emerging Sciences)

Discrete Structure *Assignment Probability*

Dr. Muhammad Ahmad



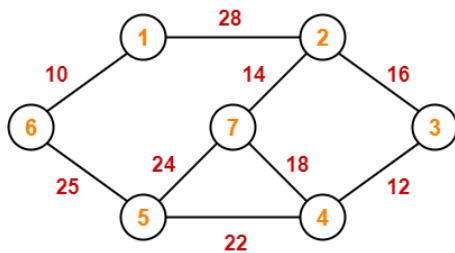
National University of Computer & Emerging Sciences
Department of Computer Science

General Guidelines

1. Peer plagiarism and the late submissions are strictly not allowed
2. Total Marks: 100
3. Your assignment submission must be in hardcopy (i.e., handwritten, or printed form)
4. **Deadline (As mentioned on Google Classroom)**
5. **QUESTIONS MUST BE IN ORDER. NO OUT OF ORDER QUESTION WILL BE MARKED.**

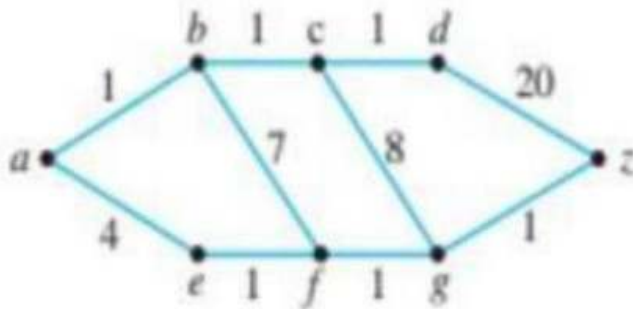
Question No 1

Construct MST of given graph step by step (otherwise no marks will be awarded) explain each step with a sentence or two. Also find its cost.



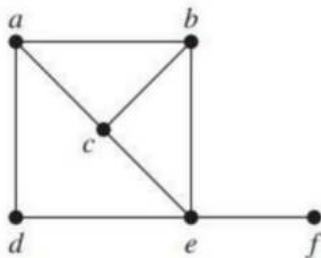
Question No 2

Apply prim's algorithms on the following graph step by step (otherwise no marks will be awarded) explain each step with a sentence or two.



Question No 3

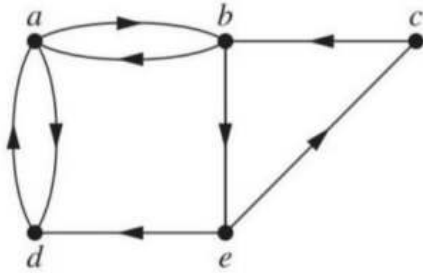
- a) Does the given graph have a Hamilton path? If it does, find it. If it does not give the reason for its non-existence.
- b) Does the given graph have a Hamilton circuit? If it does, find it. If it does not give the reason for its non-existence.



Question No 4

Does each of these lists of vertices form a path in the following graph? Which paths are simple? Which are circuits? What are the lengths of those that are paths?

- a) a, b, e, c, b
- b) a, d, a, d, a
- c) a, d, b, e, a
- d) a, b, e, c, b, d, a



Question No 5

For which values of 'n' is a K_n graph bipartite?

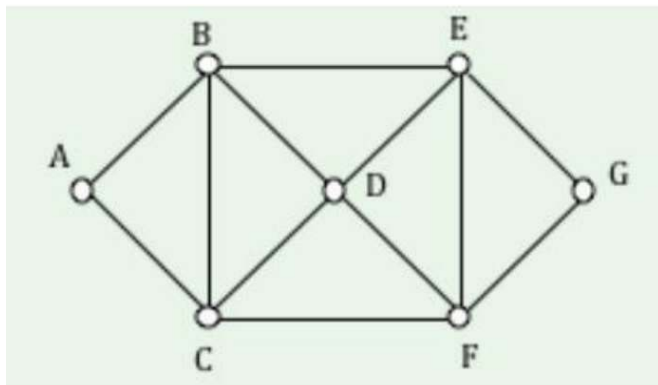
s Where K_n is a complete graph and n is the number of vertices.

Question No 6

Assume that we have 5 vertices with degrees 4,2,2,1,3. Draw its graph. **Step by step and explain each step with a sentence or two.**

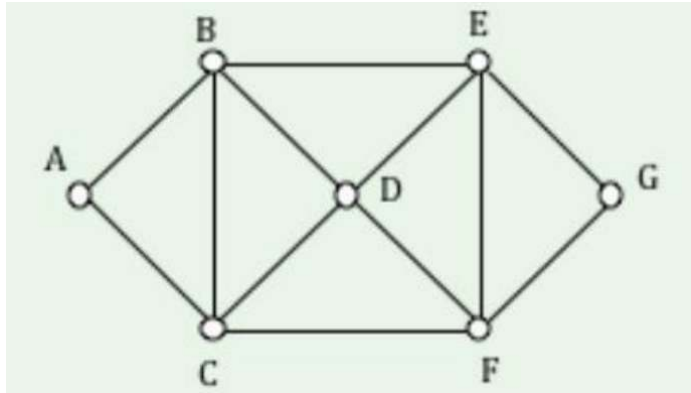
Question No 7

Find Hamiltonian circuit. **Step by step and explain each step with a sentence or two.**



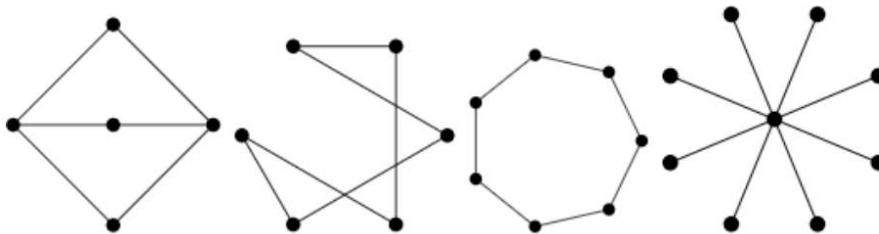
Question No 8

Find if graph has Eulers circuit or not. **And give reasons.**



Question No 9

Explain which of the following are the Bipartite Graph and which are not.



(a)

(b)

(c)

(d)

Question No 10

How much storage is needed to represent a simple graph with n vertices and m edges using the following:

[Provide proper reason/calculation for each]

a) adjacency lists?

b) an adjacency matrix?

Also explain what technique to use when graph is dense and sparse.