CS113/DISCRETE MATHEMATICS-SPRING 2024

Worksheet 21

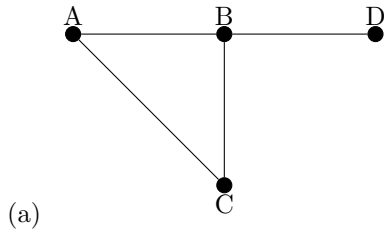## Topic: Introduction To Graphs

> Today, we'll delve into the concept of graphs, an essential tool for representing relationships between objects. Graphs consist of vertices connected by edges, allowing us to model various systems like social networks and transportation networks. Happy Learning!
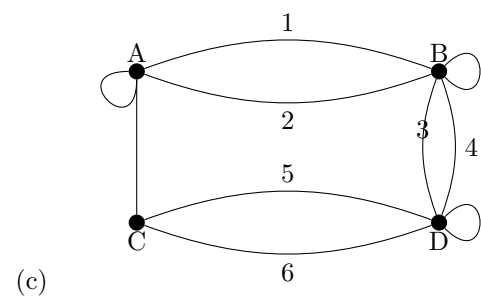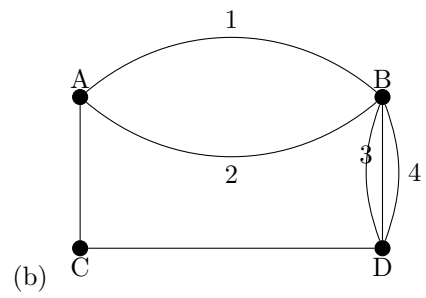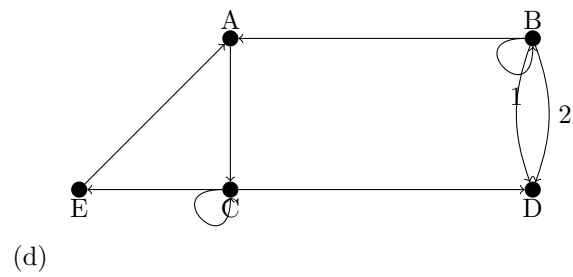
Student's Name and ID: _____

Instructor's name: _____

Graph Type	Edges	Multiple Edges Allowed?	Loops Allowed?
Simple graph	Undirected	No	No
Multigraph	Undirected	Yes	No
Pseudograph	Undirected	Yes	Yes
Simple directed graph	Directed	No	No
Directed multigraph	Directed	Yes	Yes
Mixed graph	Directed and undirected	Yes	Yes

1. Determine whether the graph shown has directed or undirected edges, whether it has multiple edges, and whether it has one or more loops. Use your answers to determine the type of graph in the given table this graph is.

(a)

(b)

(c)

(d)

2. Describe a graph model that represents traditional marriages between men and women. Does this graph have any special properties?

3. Describe a graph model that represents whether each person at a party knows the name of each other person at the party. Should the edges be directed or undirected? Should multiple edges be allowed? Should loops be allowed?

4. Construct the call graph for a set of seven telephone numbers 555-0011, 555-1221, 555-1333, 555-8888, 555-2222, 555-0091, and 555-1200 if there were three calls from 555-0011 to 555-8888 and two calls from 555-8888 to 555-0011, two calls from 555-2222 to 555-0091, two calls from 555-1221 to each of the other numbers, and one call from 555-1333 to each of 555-0011, 555-1221, and 555-1200.