# Daffodil International University

Department of Computer Science and Engineering

Faculty of Science and Information Technology

Final Examination, Semester: Summer-2019

Course Code: CSE 131 Course Title: Discrete Mathematics

Section All Course Teacher: All

**Time: 2 Hours** **Total Marks: 40**

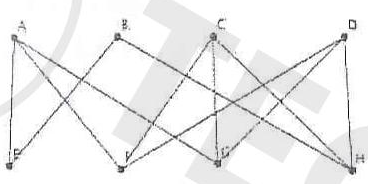
**Answer all of the following questions**

1.a) ABC company wants to setup their Local Area Network with 6 PCs. They decided to implement mesh topology (Where all the computers/nodes are connected with all other computers/nodes).

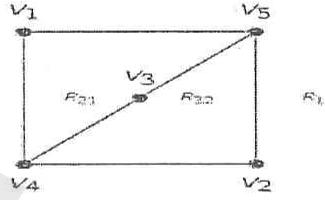
i) Draw a graph to show the network and mention the type of the graph. 2

ii) How many edges will be there if the number of computers is 10? 3

b) Determine whether the following graphs are bipartite, complete bipartite or not bipartite with explanation. 5

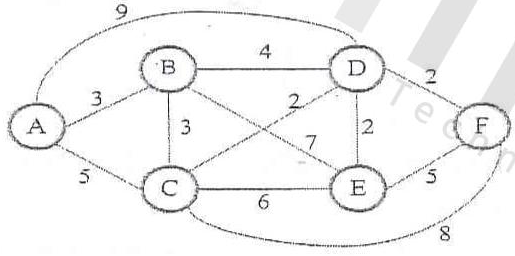



G



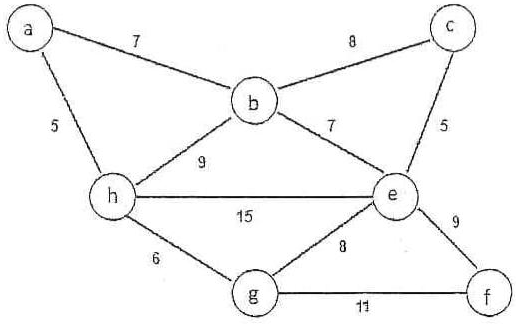

H

2.a) Use Dijkstra's algorithm to find the shortest path from A to F. You must show detailed steps, one figure for each step. 7




b) Find the transitive closure of the relation R={(a,a),(a,b),(a,c),(b,b),(c,d),(d,b)}. 3

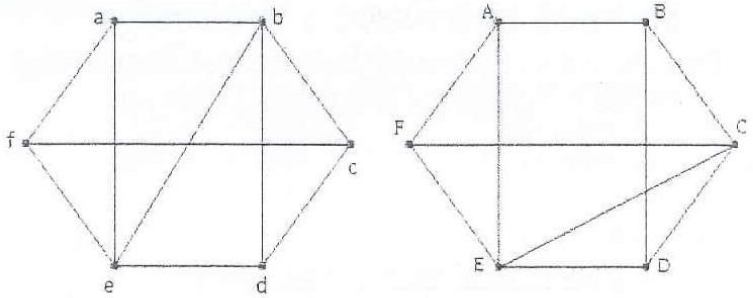
3.a) Draw the Minimum Spanning tree from the following connected graph using Prim's Algorithm 5




b) $Q_1$ has 2 vertices and 1 edge, $Q_2$ has 4 vertices and 4 edges, $Q_3$ has 8 vertices and 12 edges. Then how many vertices and edges does a $Q_4$ has?

c) How many paths of length 1 are there in $K_{3,4}$?

4.a) Are the graphs displayed below isomorphic or not? 5




4.b) Draw an undirected graph represented by the given adjacency matrix and find how many paths of length 2 are there from a to d. 2+3

$$\begin{pmatrix} 0 & 2 & 0 & 1 \\ 2 & 0 & 2 & 1 \\ 0 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{pmatrix}$$