AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH
Faculty of Science and Information Technology
Department of Computer Science
CSC 2211: Algorithms
Assignment No : 02

Name :	**ID:**	**Section:**

1. Explain Following Terms-

   i) Tree

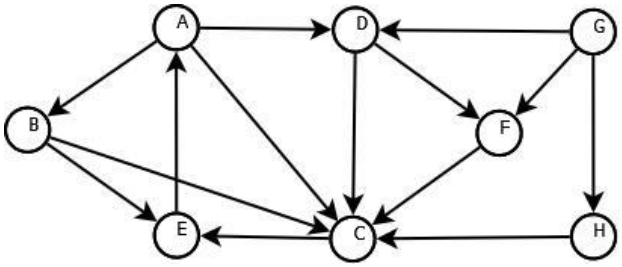
   ii) Path

   iii) Degree

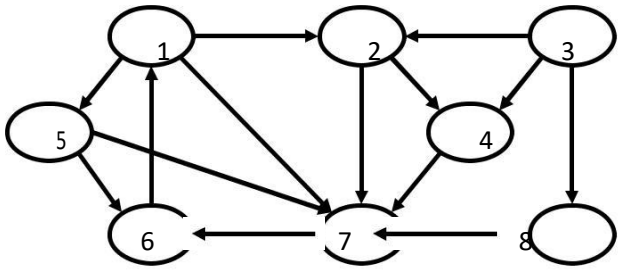
   iv) Connected Digraph

   v) Spanning Tree

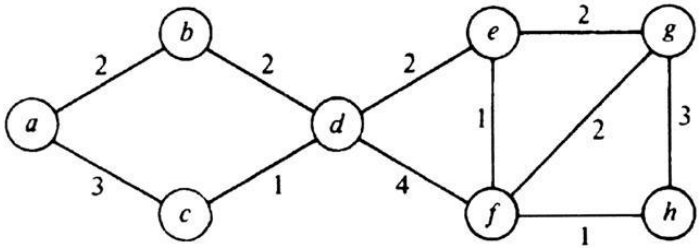
2. Consider below graph to solve this problem where **A** is the **start node**. Note that the edges in this graph are **directional**. Perform **BFS** and **DFS** to traverse the graph. Draw your DFS and BFS tree.



3. 1) Find Tree edges, Forward edges, Backward edges, and Cross edges from the graph below starting from node 1, and visit the nodes in ascending order. List the edges separately and explain in what basis you classified them.
   2) List all the possible cycles from the following graph.



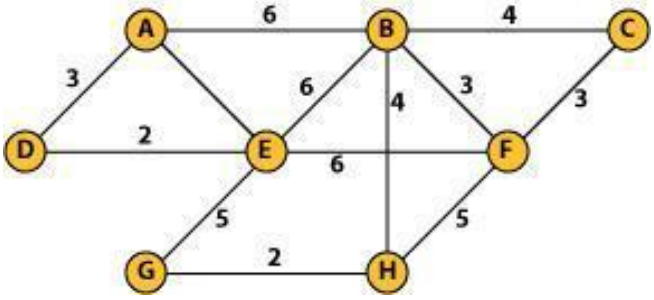
4. There are eight small disconnected cities in a country, and the Prime minister wants to build bridges to connect them so that each city can be reached from any other one via one or more bridges. The cost of constructing a bridge is proportional to its length. The distances between pairs of city are given in the following graph.



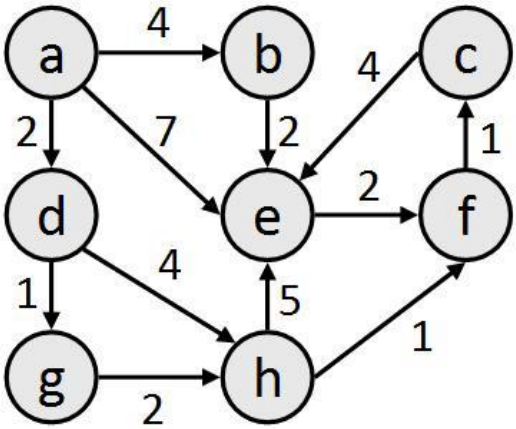
Find which bridges to build so that the total construction cost is minimum, use appropriate algorithm where 'a' is the starting node. Show your simulated work.

5. 1) Perform Kruskal's algorithm in the following graph to find out the minimum spanning tree.
   2) You should list the edges in the order in which you consider them. In each case, state whether you are adding the edge to your minimum spanning tree.
   3) Draw your minimum spanning tree.

4) Whether your minimum spanning tree is unique. Justify your answer.



6. Find out shortest path from node "**a**" to node "**h**" using **Dijkstra's** algorithm. Show your simulated work.



Instruction For Submitting Assignment :

1. First of all read the entire problem carefully then try to solve and show every detail one by one. [Only **Simulation** not Code]
2. HONESTY is the best policy; Any student involved in CHEATING will get a ZERO in Assignment and "F" Grade in Final Term Examination.
3. Printing is not allowed. **Only hand written assignment is allowed**.
4. Finally, **highlight** the assignment number in this document which you can't solve or you have problem and **attach it with your assignment copy**.
5. **Submission deadline:** [17-4-19] On Wednesday in the lab.