

2 a) Draw the following undirected graph

$$G = \{a, b, c, d, e, f, g, h, i\}$$

$$E = \{(a, b), (a, d), (b, c), (c, d), (c, e), (d, e), (d, g), (f, e), (g, f), (g, i), (h, d), (h, g), (i, f)\}$$

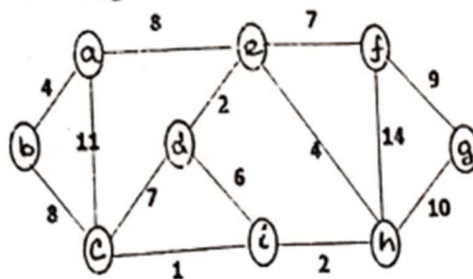
Traverse the graph using breadth first search starting vertex h. visit the nodes in lexicographic order (a,b,c,...). show only the final breadth first tree along with d and π values. You don't need to show the intermediate steps.

OR

Traverse the graph using depth first search and show the discover time d and finish time f.

b) Write an algorithm for finding the in degree of each vertex a graph G. G is represented with an adjacency list., What will be the running time for your algorithm?

c) Write the definition of minimum spanning tree. Consider the following graph what minimum tree would prims algorithm produce? Write the edges in order that the algorithm would add them to its result.

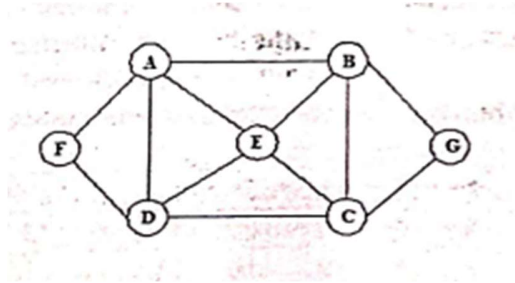


Write the definition of minimum spanning tree. Consider the following graph what minimum tree would Kruskal's algorithm produce? Write the edges in order that the algorithm would add them to its result.

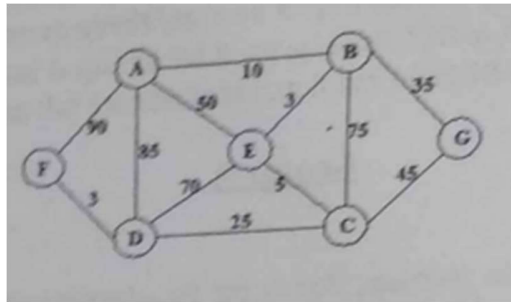
Spring – 19

2 a) Give advantages and disadvantages of BFS with respect to DFS.

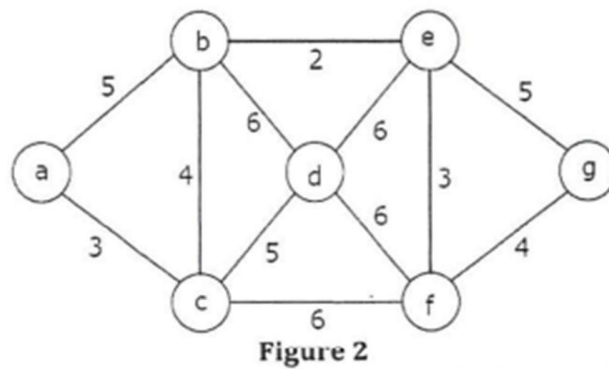
b) Show how Depth first search works on following graph if E is the source



c) Define spanning tree and minimum spanning tree. Construct minimum spanning tree from the graph using Kruskal's algorithm if E is the source.



3 a) Find a minimum spanning tree for the graph in figure 2 using prime's algorithm and show the steps in figure.



b) Kruskal's algorithm selects the shaded edges for finding MST of the graph in figure 3 . Which edge will be selected in the next iteration? Justify your choice

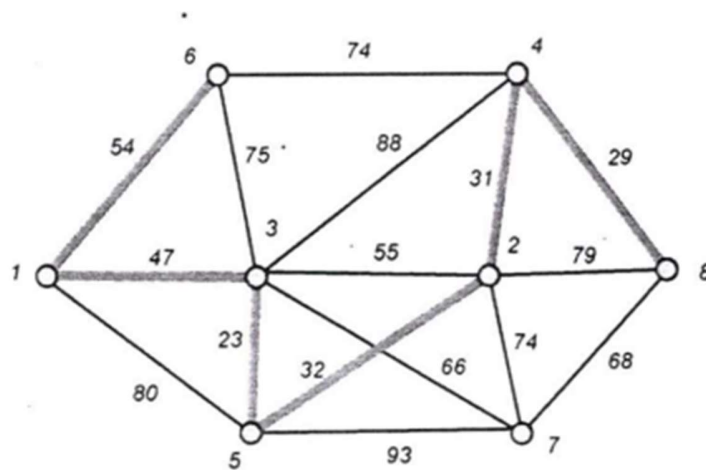
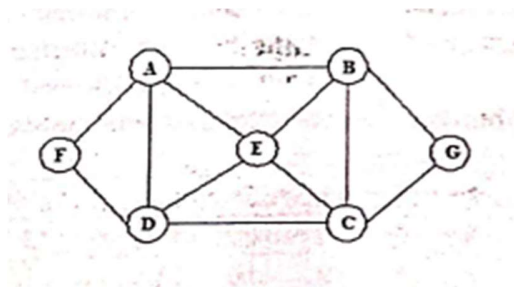


Figure 3

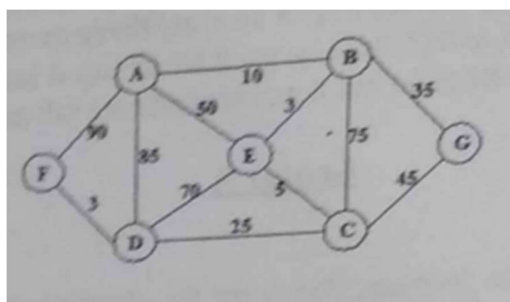
c) Using a suitable example show the MST of a graph is not always unique. Give a condition for which of a graph will be unique.

Autumn – 18

2 a) Show how Depth first search works on following graph if E is the source



b) Define spanning tree and minimum spanning tree. Construct minimum spanning tree from the graph using Kruskal's algorithm if E is the source.



c) In what order do the vertices will be visited if the graph in figure 1 is visited using BFS and DFS. Start from vertex G and assume that the adjacency list is in lexicographical order. You only need to name the vertices.

