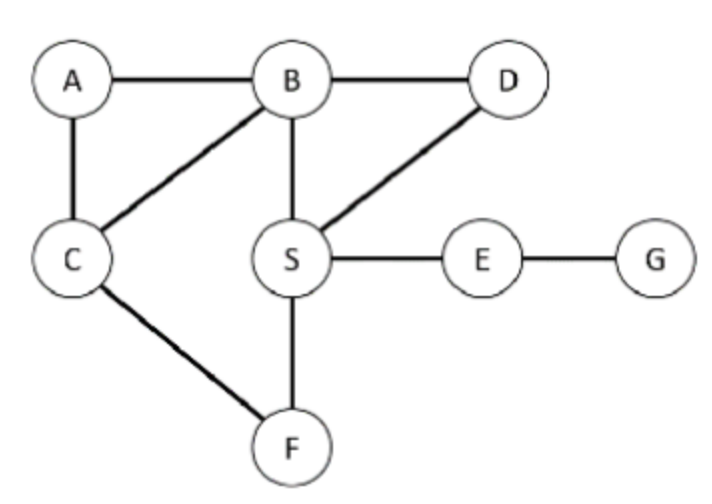
Assignment 4

Question 1

1.A



Using breadth-first search and starting from node S the order that the nodes will be visited would be: **S, B, C, E, F, A, D, G**

1.B

Using deapth-first search and starting from node S the order that the nodes will be visited would be: **S, B, A, C, F, E, D, G**

1.C

Since every edge has an equal weight in the graph, multiple minimum spanning trees can be formed by including different combinations of edges connecting all nodes without forming a cycle. therefore a minimum spanning tree is not unique when the weight of edges in the graph is equal.

Question 2

2.A

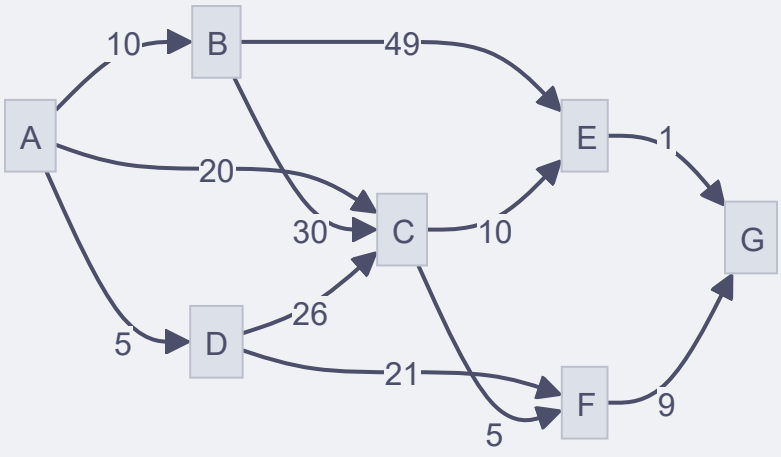
Node	Discovery time	Finish time
1	1	6
2	3	1
3	2	4
4	-	-

Node	Discovery time	Finish time
5	4	2
6	5	3
7	-	-
8	6	5

2.B

Node	Discovery time	Finish time
1	1	5
2	4	1
3	2	4
4	-	-
5	5	2
6	6	3
7	-	-
8	3	6

Question 3



3.A

1. Start with node A.
2. Choose the edge A-D with weight 5. Add node D to the MST.
3. Choose the edge D-F with weight 21 . Add node F to the MST.
4. Choose the edge F-G with weight 9. Add node G to the MST.
5. Choose the edge A-B with weight 10. Add node B to the MST.
6. Choose the edge B-C with weight 30. Add node C to the MST.

7. Choose the edge C-E with weight 10. Add node E to the MST.
   MST using Prim's algorithm: A, D, F, G, B, C, E

3.B

1. Start edge E-G (weight 1). Add it to the MST. (smallest)
2. Add edge A-D (weight 5).
3. Add edge C-F (weight 5).
4. Add edge A-B (weight 10).
5. Add edge C-E (weight 10).
   MST using Kruskal's algorithm: **E-G, A-D, C-F, A-B, C-E.**