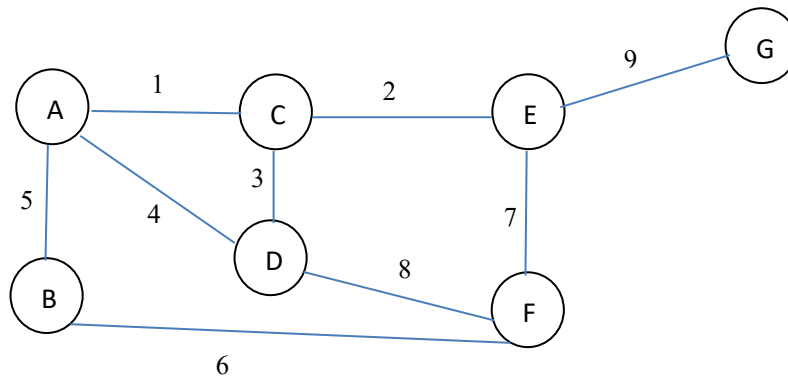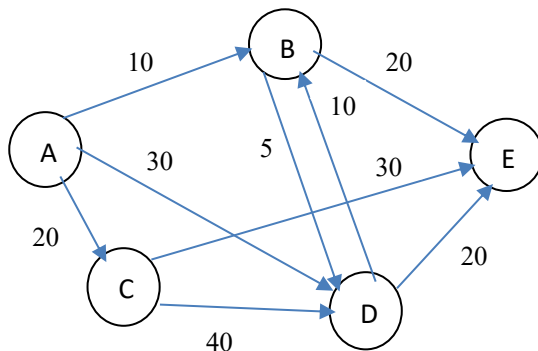1. Do you think it is possible for a minimum spanning tree to have a cycle? Justify your answer

2. Use Prim's algorithm to find a minimum spanning tree for the following graph:

3. Use Kruskal's algorithm to find a minimum spanning tree for the graph given in question 2.

4. Can Dijkstra's algorithm be used to find the shortest paths in a graph with some negative weights? If so, prove it; otherwise, give a counter example.

5. Use Dijkstra's to find the shortest paths from vertex A to all the other vertices for the graph given below:

6. Use Bellman-Ford algorithm to find the shortest paths from vertex A to all the other vertices for the graph given in question 5.