Question 1 :

We know that the Bellman Ford(BF) algorithm relaxes all edges of the graph in every iteration. Consider the scenario wherein in every iteration of the BF algorithm, a new ordering of the edges is to be used to relax them. Would this provide a correct result to the shortest path
finding algorithm ?

Question 2 :

Given a weighted, directed graph with no negative-weight cycles, let m be the maximum over all vertices of the minimum number of edges in a shortest path from the source s to V. Suggest a simple change to the Bellman-Ford algorithm that allows it to terminate in atmost m + 1 passes, even if m is not known in advance

Question 3:

Give example of Dijkstra which doesn't work on negative edges. Assume -k is the smallest edge in a graph with negative edge but no negative cycle, can we add +k to all edges and run dijkstra to get shortes distance now ?

Question 4:

Is the shortest path tree and the minimum spanning tree of an undirected weighted graph always the same ? If not are they always different ?

Question 5:

In the i-th iteration of the BellmanFord algorithm, the shortest paths of length atmost i are detected. True/False

Question 6:

Dijkstra’s algorithm relaxes the edges of every shortest path in the graph in the order in which they appear on the path. True/False

Question 7:

If all edge weights are the same which is a negative constant –k,

then, can Dijkstra be used to find the shortest path from the source to all other vertices?

Question 8:

If all edge weights are negative, can Dijkstra be modified to find the longest path?

Question 9:

Does shortest path change if all edges are added with a constant factor ?

Does it change on multiplying ?