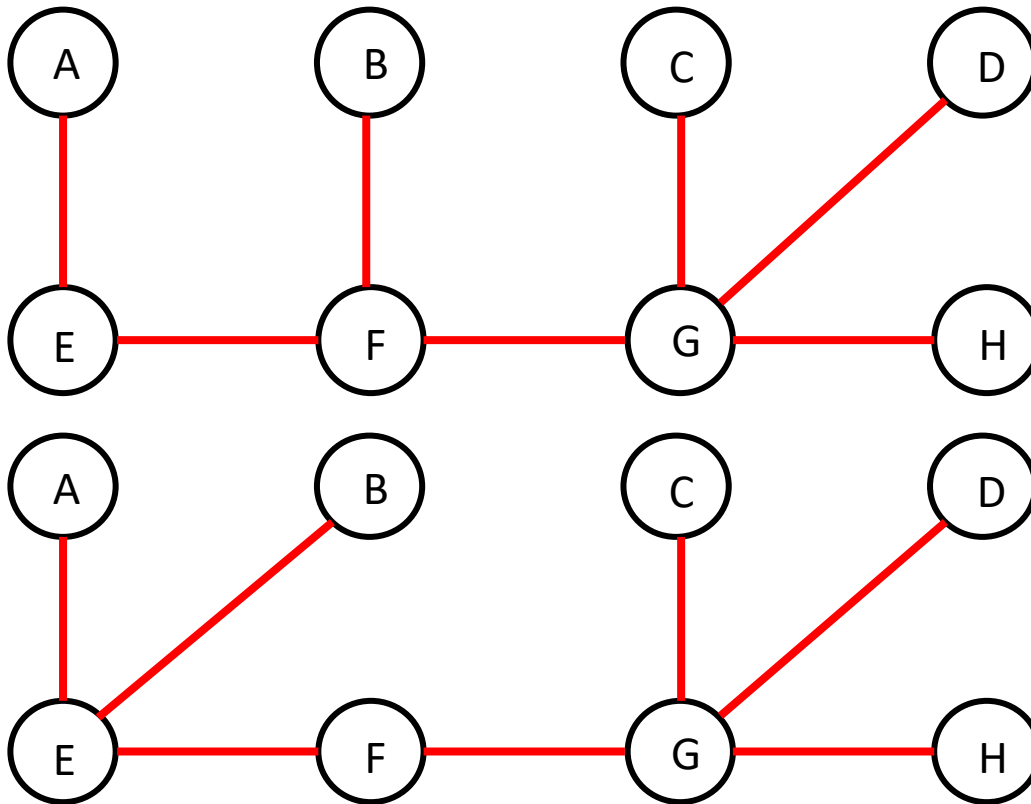## Quiz 4

1) the weight of MST is 19

2) there exist two MSTs in the graph as below:

We use contradiction and cycle definition to prove that there are two MSTs in this graph.

Firstly, we start from one edge with smallest weight, A-E, if we do not have A-E in MST (T_1), there must be another path connecting A and E, in this case, if we connect edge A-E, in T_1 there must exist a cycle including node A and node E. Therefore, since the weight of edge A-E is smallest (1), there exist a contradiction that this T_1 is MST. Therefore, edge A-E has to be included. Similarly, edge E-F has to be included. Since B-E, B-F have the same weight, we can either include B-E or B-F in the MST.

Then using the same contradiction proof, we can show that F-G and G-H must be included in the graph, to connect C and D, we just need the edge with smallest weight, which are C-G and D-H, therefore we have only two MSTs in this graph.