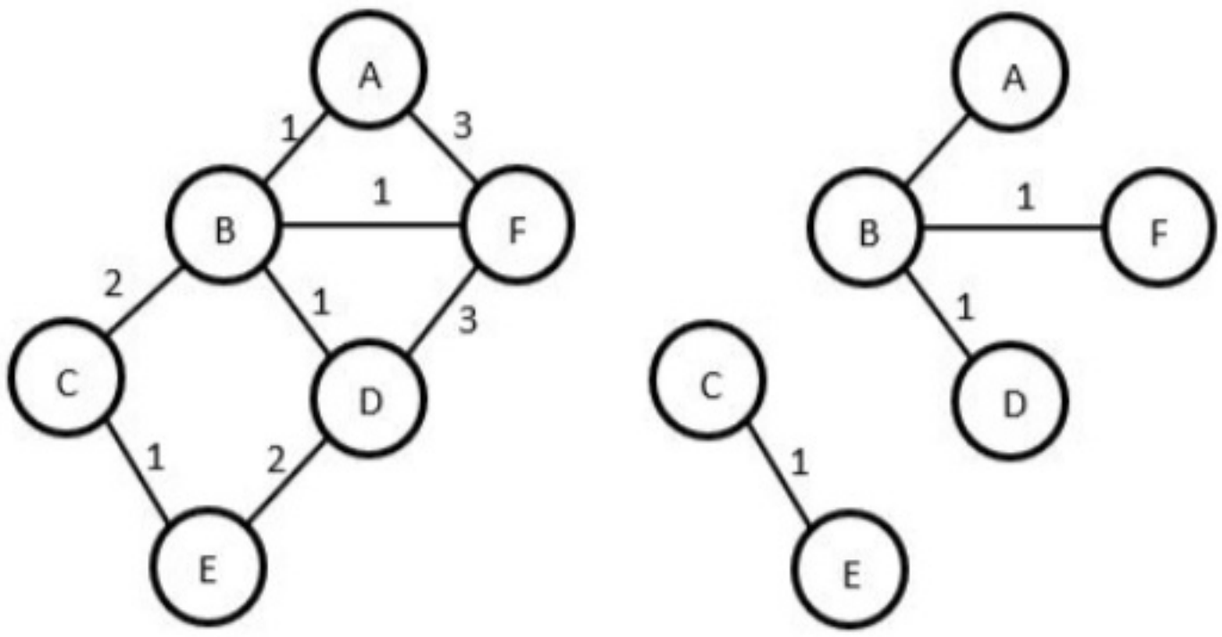
1 / 1 point

1. Consider the graph shown below and an intermediate stage of running Kruskal's algorithm on the graph.



The remaining edges to be processed in ascending order of weights are [C-B, E-D, A-F, D-F].

Select all correct answers from the list below.

- [ ] The edge C-B, when inserted, will connect two nodes that belong to the same tree in the forest.
- [x] After the edge C–B is added, there is exactly one tree in the forest.

Correct
Correct.

- [x] The edges E–D, A–F and D-F are not added to the spanning tree because their two nodes are part of the same tree in the forest.

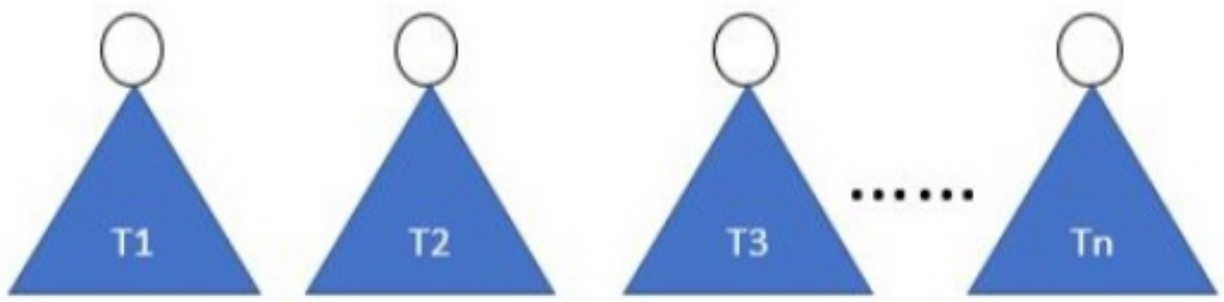
Correct
Correct. Because C-B is added first, there will only be one tree in the forest by the time E-D is considered.

- [x] Given a forest of trees, finding if two nodes belong to the same tree can be achieved in time at most O(|V|), where |V| is the total number of nodes.

Correct
Correct.

2. The schematic below represents a forest during an intermediate state of the Kruskal's algorithm. Each triangle is a tree.

1 / 1 point



Select all the correct facts about the operation of Kruskal's algorithm for minimum spanning tree referring to the figure above.

- [x] Suppose we attempt to insert an edge (A, B) with weight W, wherein A and B belong to the same tree. Then every edge in the existing path from A to B must have weight less than or equal to W.

Correct
Correct. Otherwise, the edge A-B would have been added before the other path between A and B existed.

- [x] Suppose we attempt to insert an edge (A, B) and A and B belong to two different trees in the forest. Then such an edge will be part of the final spanning tree output by Kruskal's algorithm.

Correct
Correct.

- [x] If the edges are not inserted in ascending order of weights, the resulting spanning tree would not necessarily be minimal.

Correct
Correct.

- [x] Kruskal's algorithm can be made faster if we have a way to rapidly check if two nodes in the forest are part of the same tree.

Correct
Correct.