1) 20 pts
Mark the following statements as **TRUE** or **FALSE**. No need to provide any justification.

[TRUE/]
If all edge capacities in a flow network are integer multiples of 7, then the maximum value of flow is a multiple of 7.

[/FALSE]
If P = NP, then all NP-Hard problems can be solved in Polynomial time.

[/FALSE]
Let T be a complete binary tree with n nodes. Finding a path from the root of T to a given vertex $v \in T$ using breadth-first search takes O(log n) time.

[TRUE/]
Halting Problem is an NP-Hard problem.

[TRUE/]
Every decision problem in P has a polynomial time certifier.

[/FALSE]
In a flow network, if we increase the capacity of an edge that happens to be on a minimum cut, this will increase the max flow in the network.

[/FALSE]
If the capacity of every arc is odd, then there is a maximum flow in which the flow on each arc is odd.

[TRUE/]
If the edge weights of a weighted graph are doubled, then the number of minimum spanning trees of the graph remains unchanged

[/FALSE]
The linear programming solution to the shortest path problem discussed in class can fail in the presence of negative cost edges.

[/FALSE]
In a divide and conquer solution, the sub-problems are disjoint and are of the same size.