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

[TRUE/FALSE]
Let A and B be decision problems. If A is polynomial time reducible to B and B is in NP-Complete, then A is in NP.

[TRUE/FALSE]
In a network with source s and sink t where each edge capacity is a positive integer, there is always a max s-t flow where the flow assigned to each edge is an integer.

[TRUE/FALSE]
Let ODD denote the problem of deciding if a given integer is odd. Then ODD is polynomial time reducible to 3-SAT.

[TRUE/FALSE]
Not every decision problem in P has a polynomial time certifier.

[TRUE/FALSE]
The set of all vertices in a graph is a vertex cover.

[TRUE/FALSE]
A minimum spanning tree of a connected undirected graph remains being a minimum spanning tree even if each edge weight is doubled.

[TRUE/FALSE]
A minimum spanning tree of a bipartite graph is not necessarily a bipartite graph.

[TRUE/FALSE]
Dijkstra's algorithm can always find the shortest path between two nodes in a graph as long as there is no negative cost cycle in the graph.

[TRUE/FALSE]
Given a binary max heap of size n, the complexity of finding the smallest number in the heap is O(log n).

[TRUE/FALSE]
Given a graph G=(V,E) and an approximation algorithm that solves the vertex cover problem in G with an approximation ratio r, then this algorithm can also provide a solution to the independent set of G with the same approximation ratio r.