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

[TRUE/FALSE]FALSE
In a flow network whose edges have capacity 1, the maximum flow always corresponds to the maximum degree of a vertex in the network**.**

[TRUE/FALSE]FALSE
If all edge capacities of a flow network are unique, then the min cut is also unique.

[TRUE/FALSE]TRUE
A minimum weight edge in a graph G must be in one minimum spanning tree of G.

[TRUE/FALSE]TRUE
When the size of the input grows, any polynomial algorithm will eventually become more efficient than any exponential one.

[TRUE/FALSE/UNKNOWN]FALSE
NP is the class of problems that are not solvable in polynomial time.

[TRUE/FALSE/UNKNOWN]FALSE
If a problem is not solvable in polynomial time, it is in the NP-Complete class.

[TRUE/FALSE/UNKNOWN]TRUE
Linear programming can be solved in polynomial time.

[TRUE/FALSE] FALSE
$10^{2 \log 4n+3} + 9^{2 \log 3n+21}$ is O(n).

[TRUE/FALSE]FALSE
f(n) = O(g(n)) implies g(n) = O(f(n)).

[TRUE/FALSE]FALSE
If X can be reduced in polynomial time to Y and Z can be reduced in polynomial time to Y , then X can be reduced in polynomial time to Z.