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

[TRUE]
If NP = P, then all problems in NP are NP hard

[FALSE]
L1 can be reduced to L2 in Polynomial time and L2 is in NP, then L1 is in NP

[FALSE]
The simplex method solves Linear Programming in polynomial time.

[FALSE]
Integer Programming is in P.

[FALSE]
If a linear time algorithm is found for the traveling salesman problem, then every problem in NP can be solved in linear time.

[TRUE]
If there exists a polynomial time 5-approximation algorithm for the general traveling salesman problem then 3-SAT can be solved in polynomial time.

[FALSE]
Consider an undirected graph G=(V, E). Suppose all edge weights are different. Then the longest edge cannot be in the minimum spanning tree.

[FALSE]
Given a set of demands D = *{dv}* on a directed graph *G(V,E)*, if the total demand over *V* is zero, then *G* has a feasible circulation with respect to *D.*

[TRUE]
For a connected graph G, the BFS tree, DFS tree, and MST all have the same number of edges.

[FALSE]
Dynamic programming sub-problems can overlap but divide and conquer sub-problems do not overlap, therefore these techniques cannot be combined in a single algorithm.

Grading Criteria: Pretty clear, each has two point. These T/F are designed and answered by Professor Shamsian