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

[TRUE/FALSE]
Given a network *G(V, E)* and flow *f*, and the residual graph G_f(V', E'), then |V|=|V'| and 2|E|>=|E'|.

[TRUE/FALSE]
The Ford-Fulkerson Algorithm terminates when the source *s* is not reachable from the sink *t* in the residual graph.

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

[TRUE/FALSE/UNKOWN]
If problem A is NP complete, and problem B can be reduced to problem A in quadratic time. Then problem B is also NP complete

[TRUE/FALSE/UNKOWN]
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.

[TRUE/FALSE]
Let G(V,E) be a weighted graph and let T be a minimum spanning tree of G obtained using Prim's algorithm. The path in T between *s* (the root of the MST) and any other node in the tree must be a shortest path in G.

[TRUE/FALSE]
DFS can be used to find the shortest path between any two nodes in a non-weighted graph.

[TRUE/FALSE]
The Bellman-Ford algorithm cannot be parallelized if there are negative cost edges in the network.

[TRUE/FALSE]
A perfect matching in a bipartite graph can be found using a maximum-flow algorithm.

[TRUE/FALSE]
Max flow in a flow network with integer capacities can be found exactly using linear programming.