**COT 4210 Quiz #3 (4/5/2012)**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1) (15 pts) A tree is a undirected unweighted graph that is connected and does not have any cycles. Let L1 = { G | G is a undirected unweighted graph that is a tree. } Prove that L1 $\in $ P.

2) (15 pts) In the last class, we showed that 3-SAT $\leq \_{P}$ Vertex-Cover via a polynomial-time reduction. Show the output of executing that reduction on the Boolean formula in 3-CNF shown below:

$$(a⋁b⋁\overbar{c})⋀(\overbar{a}⋁\overbar{b}⋁c)⋀(\overbar{a}⋁\overbar{a}⋁b)⋀(\overbar{b}⋁\overbar{b}⋁\overbar{c})⋀(\overbar{a}⋁\overbar{b}⋁c)$$

3) (20 pts) Briefly explain why in the proof of the Cook-Levin Theorem, a 2 x 3 window was used to verify the consistency of the tableu. In particular, explain why 1 row is not enough, why 3 rows is unnecessary, why 2 columns is not enough, and why 4 columns is unnecessary.