Exam 1: Econ 3300
September 19, 2013

There are a total of 100 points on the exam. Show all of your work. This is closed book exam. You are not allowed to use your textbook, notes, or any other resource besides what I have given you. If you do not understand a question or find the question vague, ask me about it. Likely other people will be having the same trouble. If you decide you need to make additional assumptions after asking me, clearly state your assumptions when completing the problem.

You may use calculators for arithmetic but no functions (or other short-cuts). Good luck!

Short Answer Questions (*40 pts.*)

Please answer the following questions. Where appropriate, you are encouraged to draw pictures / diagrams to help explain your answer.

1. What is the Coase Theorem. Give an example of how it can be used / implemented. (***5 pts.***)
2. Define the equimarginal principal and explain its practical meaning. (***5 pts.***)
3. What is the difference between nominal and real interest rates? Give a numerical example. (***5 pts.***)
4. Does Hotelling's Rule suggest that non-renewable resource prices should increase in nominal or real dollars? Why? (***5 pts.***)
5. What are the First and Second Welfare Theorem of Economics? What conditions need to be met in order for the theorems to hold? (***5 pts.***)
6. What is an externality? Give an example of a positive and negative externality and how much of the externality producing good we expect a competitive market to provide relative to the social optimal. Explain your answer. (***5 pts.***)
7. Define a Nash Equilibrium and draw a game that has only one Nash Equilibrium. Circle the equilibrium. (***5 pts.***)
8. How should a monopoly firm decided how much of a good to produce? Explain. (***5 pts.***)

I promise that I have neither given nor received any unauthorized help during this exam and have abided by all of the rules written on this exam and expectations in the GT Honor code.

Signature: _____

Analytical and Longer Questions (*60 pts.*)

1. A small town of 20 people (10 adults and 10 children) has a cement plant in it. As part of the production process, the cement plant emits volatile organic compounds into the local environment that causes health problems for the 20 local residents. The owner of the plant can reduce the amount of volatile organic compounds it releases through a technology that costs \$12 per pound of volatile organic compounds reduced per week. The owner knows that the emissions cause health problems for him (and everyone else), so he is willing to reduce his profits to do some pollution abatement to improve only his health. His (and all of the other adults) marginal benefit of abatement curve is $P = 18 - 2Q$ where Q is the reduction in emissions per week. The marginal benefit of abatement curve for the children is $P = 9 - Q$.

   (a) How much abatement does the owner engage in if he only cares about himself? (***10 pts.***)
   (b) What is the social willingness to pay for this level of pollution abatement? (***10 pts.***)
   (c) What is the socially efficient level of abatement? (***10 pts.***)

2. The market demand function for gasoline is $Q = 200 - 20P$. There are 100 firms producing and selling gasoline so that the market can be considered competitive. Each firm has a marginal cost curve of $MC = 3$.

   (a) What is the market clearing price and quantity of gasoline? What is the social welfare at this price and quantity? (***7 pts.***)
   (b) In the search for profits, firms begin to buy out other firms until there are only two firms left, each with a constant marginal cost of production of \$3. What is the equilibrium price and quantity? What is the social welfare now? Who, if anyone, gains and loses from these mergers? (***15 pts.***)
   (c) The two remaining firms now merge to form a monopoly in the gasoline market. What is the new equilibrium price and quantity? What is the social welfare? (***8 pts.***)