

Possible topics for Midterm, Intro to Env. and Res Econ, Fall 2004

- Graphically and verbally analyze the impact of changes in consumer incomes, prices of substitute goods, input costs, and production technology on market-clearing price and quantity in the absence of externalities. (Like Chapter 7, Review question 3, but you should trace each impact to a shift in the demand or supply curve and the subsequent impact on market-clearing quantity and price)
- For both positive and negative externalities on the demand or supply side (4 possible cases), be able to:
 1. Identify, graphically and numerically (for externalities with constant marginal damages), the free-market equilibrium in the absence of externalities. For this equilibrium, be able to explain why we expect it to be an equilibrium (explaining why other points would not be an equilibrium is a useful part of this.) Also, be able to identify, graphically and numerically, consumer and producer surplus and explain why these represent gains from trade in that market. Explain why the free-market equilibrium is considered to be socially optimal when certain conditions hold. Be able to explain, briefly, the role of these conditions.
 2. Be able to define an economic externality and give examples of both positive and negative externalities.
 3. Be able to explain why the free-market outcome is not efficient when externalities are present. Be able to graphically and numerically identify the total consumer surplus, producer surplus, and externality damage or benefit for the free-market outcome.
 4. Be able to graphically and numerically identify the socially optimal solution when externalities are present. Be able to graphically and numerically identify the gain to moving from the free-market to the socially optimal solution.
 5. Calculate the Pigovian tax or subsidy that would in theory bring about the socially optimal outcome.
 6. Demonstrate the potential for Coasean bargaining at the free-market solution, identifying the possible gains from trade for each party. Explain why bargaining would be expected to lead to the socially optimal outcome.
 7. Discuss the theoretical conditions necessary for both Pigovian taxation and Coasean bargaining to succeed. Discuss possible factors that would influence the success of each strategy in achieving a socially optimal outcome.
- For a given industry with two heterogeneous polluting firms, where the firms' and the social cost function are expressed in terms of abatement, be able to:
 1. Calculate the socially optimal/allocatively efficient level of total abatement.

2. Given this level, calculate the cost-efficient distribution of abatement between the two firms. Explain why this may involve unequal levels of abatement.
3. Calculate the tax rate which would theoretically bring about the socially optimal level of abatement.
4. Calculate the optimal distribution of abatement for each firm, assuming the allocatively efficient level of abatement.
5. Demonstrate that the tax calculated above could lead to this division of abatement.
6. Starting at a uniform standard, demonstrate how abatement trades could lead to the cost efficient allocation of abatement. Identify the gains from trade, and the total cost savings by moving from the uniform to the cost efficient solution.
7. Discuss the factors required for a tradable permits market to succeed.
8. Discuss the difference between allocative and cost efficiency.

Note: I may ask you to discuss other details of the problems. In general, written explanations will be quite important and may make the difference between an adequate exam and an outstanding one.

Second note: This year's exam will be shorter than last year's, and you will have the whole time period. I'll post last year's exam on the web, and will send out the answer key on request (in case you want to do last year's exam for practice).