

Economics 3250  
Spring 2005

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Exam 1

**Do Not Turn This Page Over Until You Are So Instructed!**

This exam has 25 points. There are six questions on the exam. Questions 1, 4, and 5 are worth 5 points each; Questions 3 and 6 are worth 4 points each; and Question 2 is worth 2 points. Put your answers to the exam in a blue book or on blank sheets of paper.

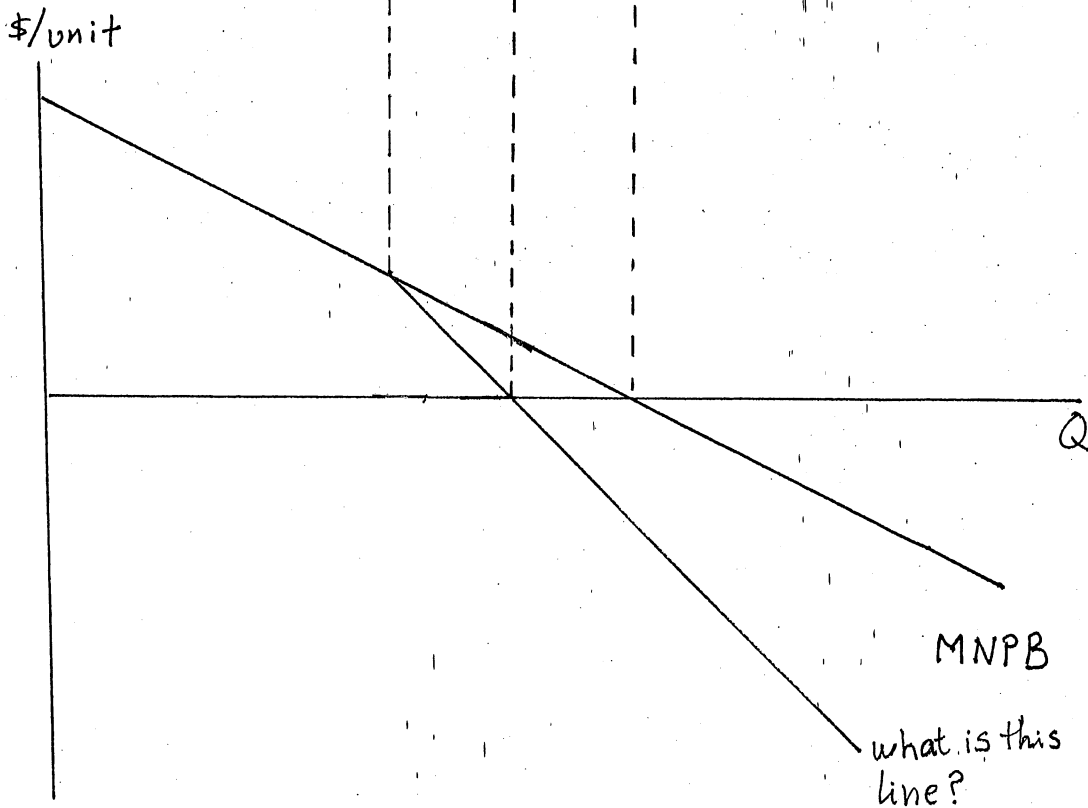
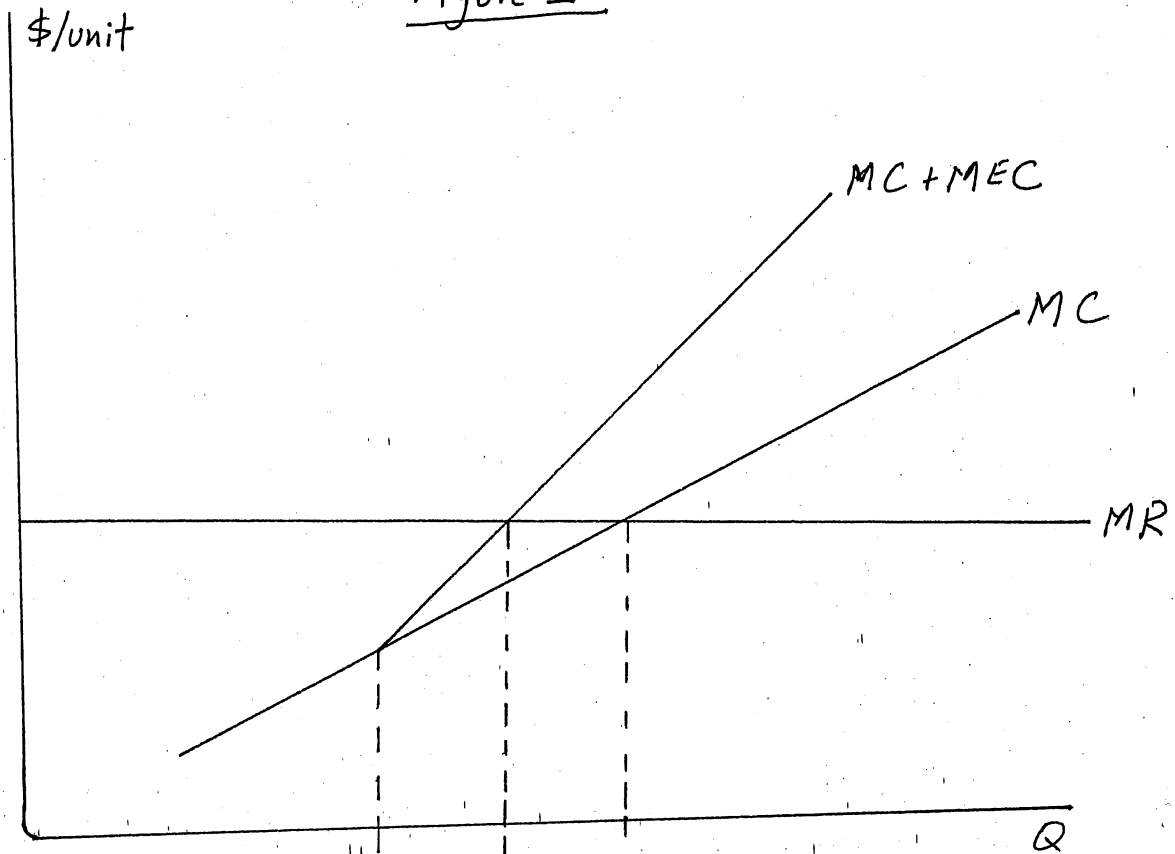
You have **one hour** (that is, until **11:45am**) to take this test. After the test is over, I'll lecture until the regular class period ends.

Answer the questions using as much precision and detail as the time allows. Correct answers which are unsupported by explanations will not be awarded points.

**Answer all of the following six questions.**

1. **[5 points]** Explain Figure 1. This includes defining the terms used there and describing the economic behavior it illustrates.
2. **[2 points]** Give two reasons why a country may have bad environmental problems even if it is led by very well-meaning, honest politicians who think only of the well-being of society as a whole.
3. **[4 points]** Argue *both* for *and* against the proposition that: “higher discount rates cause more environmental damage.”
4. **[5 points]**
  - (a) Describe the distinction between “revealed preference” approaches to valuation and “expressed preference” approaches to valuation. (Also explain what “valuation” means.)
  - (b) Give two examples of “revealed preference” approaches to valuation. Why do they fit into the “revealed preference” category?
  - (c) Give one example of an “expressed preference” approach to valuation. Why does it fit into the “expressed preference” category?
5. **[5 points]** State and explain the Coase Theorem. In so doing, use a graph.
6. **[4 points]** This question concerns the chapter entitled “Charging for use of the environment.”
  - (a) Distinguish between emissions charges, user charges, and product charges. Remember to state who pays each charge.
  - (b) In the context of this chapter, what does “market support” mean? Also, state one policy that is an example of a “market support” policy.

Figure 1



Answers to Exam 1, Econ 3250, Spring 2005

- ①  $MR$ : the firm's marginal revenue  
 $MC$ : the firm's marginal cost  
 $MEC$ : marginal external cost borne by the victims of the firm's pollution  
 $MNPB = MR - MC$ : marginal net private benefit

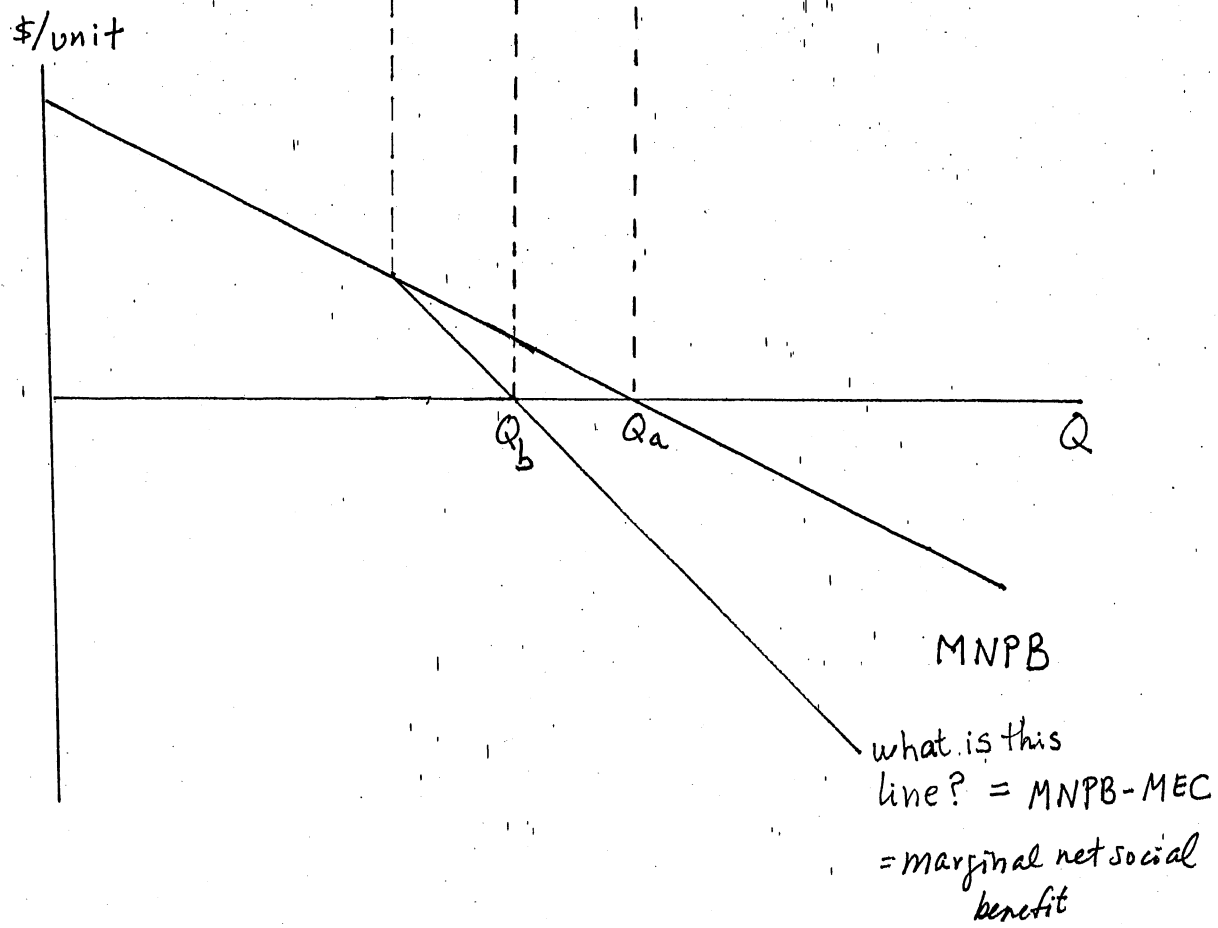
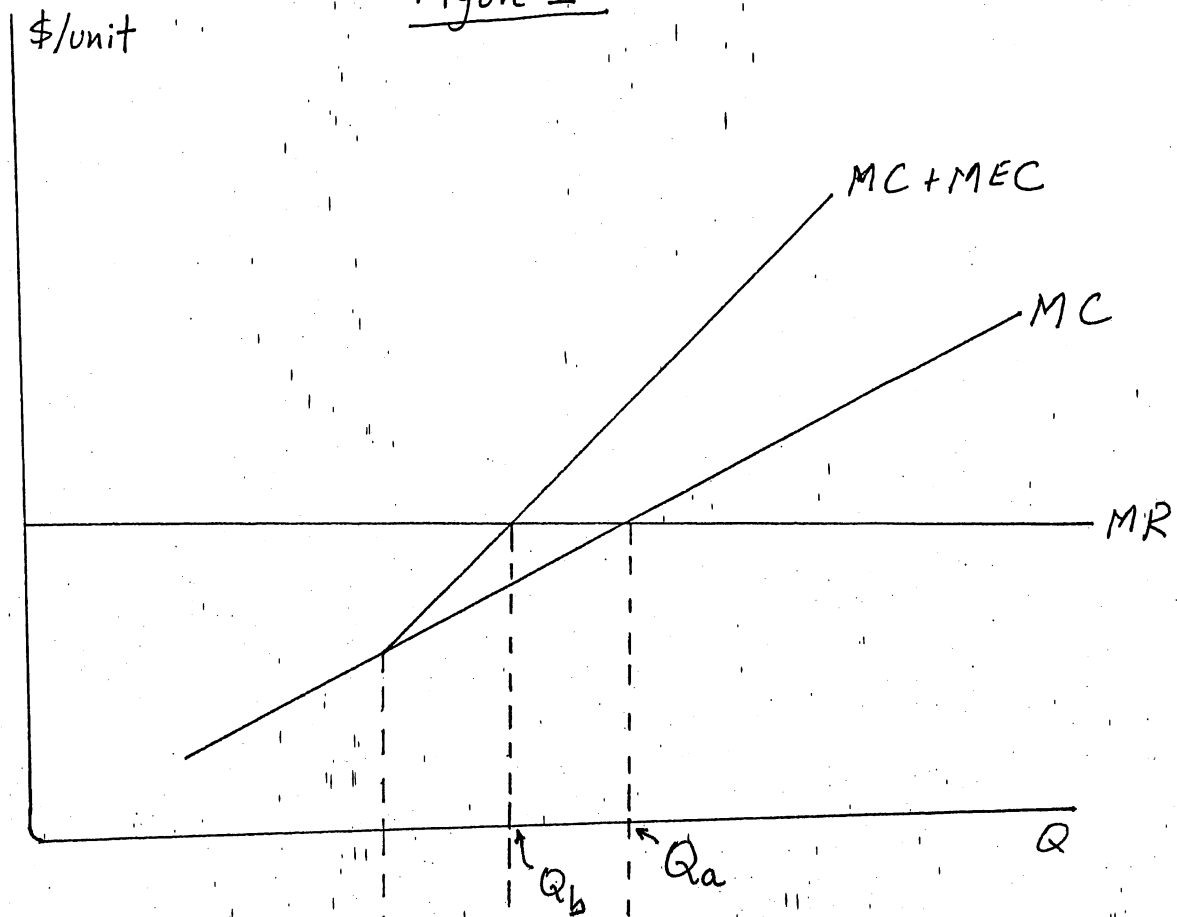
$Q$ : output

The firm wants to produce  $Q_a$ . If it produced less,  $MR > MC$  and more output would be desirable (profit would  $\uparrow$  since profit is  $TR - TC$  and marginal profit is  $MR - MC$ ). If  $Q > Q_a$ ,  $MR < MC$  and less output would  $\uparrow$  profit.

The firm ignores  $MEC$  but society doesn't (or shouldn't), so society wants  $Q$  to be  $Q_b$ , where  $MR$  (<sup>marginal</sup> social benefit) equals  $MC + MEC$  (social cost at the margin).

The bottom graph just restates the top graph. The firm wants  $MR = MC$ , so it wants  $MNPB = 0$ . Society wants  $MR = MC + MEC$ , so it wants  $MNPB - MEC = 0$ .

Figure 1



②

- a) Lack of information ; imperfect scientific knowledge
- b) the principal-agent problem that bureaucrats / civil servants may not do what the political leaders want them to do.

[In the real world, the bureaucrats might be honest and the politicians dishonest.]

③

For: If there are future environmental damages, those become less important at high discount rates.

Future environmental benefits (such as from afforestation) similarly become less important.

Both would lead to approval of more environmentally-damaging projects.

Against:  $\uparrow$  interest rates  $\Rightarrow \uparrow$  cost of capital equipment  $\Rightarrow \uparrow$  cost of the machines needed to do environmental damage  $\Rightarrow$  less environmental damage.

④

a) valuation: putting a dollar value on something (especially a non-marketed good, since market goods already have a price)

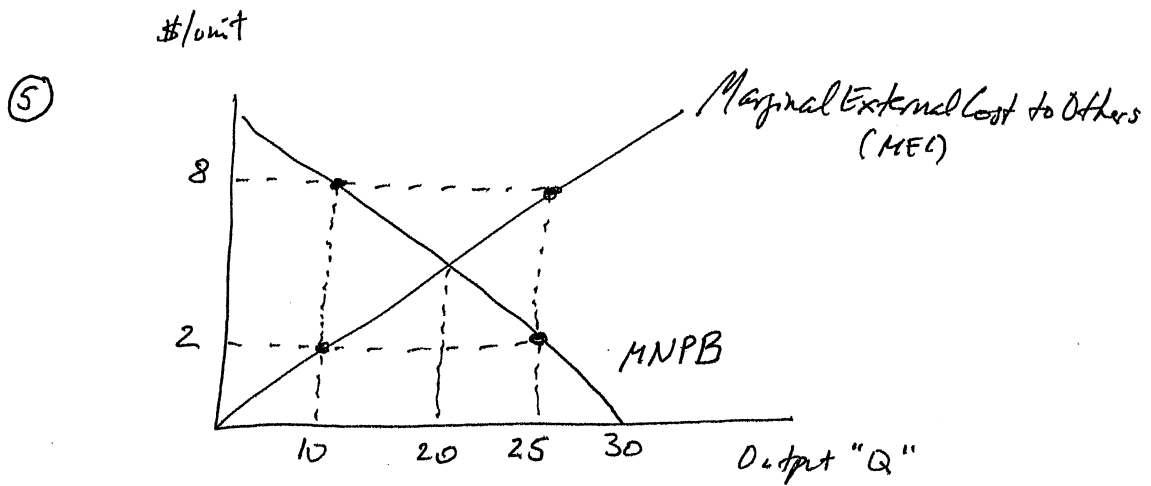
revealed preference: deducing value from observations of people's actual behavior

expressed preference: determining value from questionnaires (what people say they would do, not what they actually do do)

b) travel cost: a site must be worth at least what someone paid to visit it (so you observe what they really did pay)

hedonic pricing: you observe how prices actually do vary in response to environmental amenities or dis-amenities.

c) contingent valuation asks respondents their values for different things



If the firm has the right to pollute: pollution victims can bribe\* the firm to go from  $Q=30$  to  $Q=20$  because the amount the victims are willing to pay (MEC) is greater than the payment the firm would require (MNPB). But  $Q \neq 20$  because there  $MEC < MNPB$  so no deal could be struck.

If victims have the right to fresh air: the firm can bribe\* the victims to go from  $Q=0$  to  $Q=20$  because the amount the firm is willing to pay (MNPB) is greater than the payment the victims would require (MEC). But  $Q \neq 20$  because there  $MNPB < MEC$ .

So regardless of property rights,  $Q$  goes to its <sup>socially</sup> optimal level of 20 with no bargaining costs.

\* I don't mean "bribe" in any negative way; "pay" might be a better choice of words.



⑥

a) emissions charges: paid by the firm, proportional to the amount of pollution generated

use charges: paid by polluting firms, but not in proportion to the amount of pollution

product charges: paid by the consumers who buy items whose manufacture causes pollution

b) market support: government policies to stabilize prices (or maybe other variables like costs)

Example: trying to stabilize the price of waste paper so a stable recycling market for it can develop