Econ 496/598 Midterm Exam
15/2/2012

This is a 70 minutes exam. It consists of two parts: part 1 has three analytical problems to choose two; part 2 has ten "true or false" questions to choose six. Each analytical problem worth 35 marks and each "true or false" question worth 5 marks so arrange your time properly. Good luck!

Part 1: Analytical Problems. Solve two problems.

Problem 1 Assume that the demand curve for an environmental good is fully coincidental with the social marginal benefit function and can be described as $MB_S = MB_P = 12 - 3q$, where q refers to the quantity of the good. Assume that the private marginal cost function can be described by $MC_P = q$, and that external marginal costs are always double the marginal private cost.

(a) Determine an equation for the marginal social costs (MC_S). *[7 marks]*

(b) Graph the functions and algebraically determine *(i)* the market level of output, and *(ii)* the social optimal level of output. *[10 marks]*

(c) Calculate social welfare at the market level of output and at the optimal level of output. What is the deadweight loss from these social costs? *[10 marks]*

(d) Is it possible to correct this externality? Explain. *[8 marks]*

Problem 2 Suppose the state is trying to decide how many miles of a very scenic river it should preserve. There are 100 people in the community, each of whom has an identical demand function given by $P = 10 - q$, where q is the number of miles preserved and P is the per mile price he or she is willing to pay for q miles of preserved river.

(a) Derive the marginal social benefit (market demand) for that good. *[8 marks]*

(b) If the marginal cost of preservation is \$500 per mile, how many miles would be preserved in an efficient allocation? *[10 marks]*

(c) What are the net benefits associated with the preservation project? (*Hint: a graph might help you!*) *[10 marks]*

(d) Explain intuitively why the efficient allocation might be hard to achieved through the market mechanism. *[7 marks]*

Problem 3 Assume society is trying to allocate 40 units of a depletable resource across two time periods. Demand is given by the equation $P_i = 16 - 0.5q_i$, where $i = 1, 2$. The marginal extraction cost for the resource is constant at \$1 per unit. The discount rate is $r = 0.10$.

(a) Is this resource in scarcity? Support your answer with the proper calculations. *[6 marks]*

(b) What are the efficient quantities for each of the two periods? *[15 marks]*

(c) What are the efficient prices for each of the two periods? *[7 marks]*

(d) What is the marginal user cost associated with this resource in each period? *[7 marks]*

Part 2. True or False. Choose 6 questions. Explain fully (answer with no explanation will get no marks).

1. When using the expected value of net benefits to evaluate different projects the underlying assumption is risk neutrality. However, risk neutrality is a natural assumption when the projects affect large populations.
2. Static efficiency is achieved when the consumer surplus is maximized.
3. A property rights system that satisfies exclusivity and enforceability but not transferability does not guarantee good maintenance of the resources.
4. The "tragedy of the commons" is the result of non-exclusivity and indivisibility of the resources.
5. Consider the production of a good that causes external damages (negative externality). Then it is certain that a perfectly competitive market will guarantee higher social welfare compared to a monopoly.
6. Rent-seeking behavior is a source of market failure.
7. Dynamically efficient allocations always satisfy the sustainability criterion.
8. Contingent Valuation Methods (CVMs) are unbiased.
9. Hartwick‘s Rule applies the concept of strong sustainability.
10. Coase‘s theorem has limitations.