

Econ 294, Environmental Economics, Midterm Exam, MSQE 1st year

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Name _____

Instructions: Answer all questions. Points for each question are given in brackets. Allocate your time accordingly. The exam carries a total of 60 points. Please stick to the point. Irrelevance will be penalised. Total time: 1 hour 20 minutes.

- (5) Define willingness-to-pay and willingness-to-accept for a change in environmental quality.
 - (5) Explain when they will differ, using a diagram.
 - (5) Which method of valuing an environmental good can be expected to produce a higher estimate of its value: contingent valuation or the travel cost method? Why?
- Following Weitzman (1974), let the social benefit of abating quantity q of pollution be

$$B(q) = b + B_1(q - \hat{q}) - \frac{1}{2}B_2(q - \hat{q})^2$$

and the producer's cost of abating q be

$$C(q, \theta) = a(\theta) + (C_1 + \theta)(q - \hat{q}) + \frac{1}{2}C_2(q - \hat{q})^2$$

where the value of θ is known to the producer, but is random for the regulator with $E[\theta] = 0$. Here \hat{q} is the value of q at which the regulator's marginal benefit equals his expected marginal cost. $B_1 = C_1$, $B_2, C_2 > 0$ are numbers, and a is a function.

- (5) If $h(p, \theta)$ is the quantity chosen by the producer when the regulator sets the price of per unit of abatement p , derive and interpret the expression for $\partial h / \partial \theta$.
 - (5) Write down the expression for [the expected net benefit from price regulation] - [the expected net benefit from quantity regulation]. Interpret it by explaining when price regulation will be preferable to quantity regulation, and when the reverse will be true.
 - (5) Is there a sense in which the use of a price instrument can be "disastrous" more often than the use of a quantity instrument? Explain.
- (5) Explain how private incentives for disclosure of information relating to environmental quality vary with the setting: the product setting, the occupational setting, and the community setting.
 - (5) When there is mandatory disclosure in the community setting, what incentives do firms have to abate in response? How do these vary with community characteristics? What does this imply for the distributional implications of a policy of mandatory disclosure as the only regulatory strategy?

3. (20) As an expert in environmental economics, you are asked to make suggestions to the government on how to reduce vehicular air pollution in Delhi. It is made clear to you that only those suggestions that will please a majority of voters, not displease any significant section too much, and not impose too great a burden on the government budget will be adopted. What range of policies would you suggest that meet these constraints?

State clearly any assumptions you are making. Given your assumptions, you must justify your recommendations. If you suggest a policy instrument, explain why it is superior to the relevant alternatives. Order the suggested policies in terms of their likely social net benefits and explain your ordering. You are making practical suggestions so you must take all costs, including those of monitoring and implementation into account. Think out your answer and organise it (in rough) before writing it out.