

Answer all of the following questions. The answers should be *entirely your own work*. Answers should be submitted via e-mail by midnight March 23. Your entire set of answers should be less than eight pages long. When answering short answer and essay questions be sure to give your interpretation of the question as part of the answer.

I. Concepts and Definitions (5pts each, 4-5 sentences):

- i Externality
- ii Neutral Tax
- iii Ramsay Tax
- iv Tullock Contest Success Function
- v Capture Model of Regulation

II. A Few Short Review Questions

1. (5 pts) Taxation

- i Determine marginal and average tax rates for the following tax schedule:

$$T = C + .20Y$$

- ii Is this tax progressive, regressive, or proportional? Explain.

2. (10 pts) Al's marginal benefit curve for a pure public good is $MB_a = 400 - 4Q$ and Bob's MB curve is $MB_b = 100 - Q$. Suppose that the Al provides the public service and that it can be produced at constant costs with $MC = 40$.

- i Characterize the free rider output of the pure public good.
- ii Characterize the Pareto optimal level of this pure public good
- iii Determine the Pigovian subsidy rate which can induce Al to produce the Pareto optimal level of the pure public good.

3. (10 pts) Suppose that N individuals have the same underlying utility function for private and public goods $U = u(V, G)$ where V is a pure private good, and G is a pure public good. Let $200 = V + G$ be the production possibility frontier faced. Derive the Samuelsonian conditions for the optimal level of public good G.

III. Public Economics II Problems and Puzzles

1. (10 pts) Depict a Pareto efficient market for tradable emissions permits. Note the market clearing price and the savings that a grand-fathered version of this system will yield over a uniform command and control solution. Explain briefly the logic of the savings and how politics undermine the attractiveness of this regulatory approach to environmental problems.
2. (10 points) Analyze the concept of rent seeking.
 - i Carefully define rent seeking. Under what circumstances are rents completely dissipated by socially wasteful expenditures?
 - ii Construct a 3-person rent seeking contest using a Tullock contest success function. Define all variables, determine the strategies of each player and the Nash equilibrium of your contest.
 - iii Do institutions matter in determining the degree of rent dissipation? If so, illustrate and/or discuss how such effects can be incorporated into your model..
 - iv Is this rent-seeking model compatible with Peltzman's theory of regulation?

IV. **True False (5 points each, short answer 4-8 sentences)** Determine whether or not each of the following statements are true, false, or uncertain. Explain your reasoning *very briefly* in four to eight sentences. (The explanation is generally more important than the answer given.) Include a carefully labeled diagram if it helps to clarify your reasoning.

- i If a person wants to maximize the rent-seeking activity associated with a contest for fixed prize Z where the probability of player I 's success is $P = E_i / \sum E_j$ and the cost of effort is 1 dollar per unit, the person controlling the game would prefer a 2 player game to an $N > 2$ player game.
- ii The median voter model is completely incompatible with sustained growth in the size of government.
- iii In the standard Tullock probabilistic rent seeking game, average rent-seeking expenditures rise as the number of players increases.
- iv The existence of deregulated industries contradicts Stigler's model of regulation.