

RESOURCES ECONOMICS PRELIMINARY EXAMINATION
June 25, 1990

You have until 12:00 (four hours) to complete this examination. Exams will be collected promptly. Pace yourself in responding to questions so that you do not spend an undue amount of time on any one question at the expense of other questions. Write the last three digits of your student ID number at the top of each page of your answers, and do not write your name anywhere on the answers.

Part I: Answer all of the following three questions.

1. An individual consumes but two goods, x and y. Her utility function is

$$U = 2x^{0.5}y^{0.5} .$$

x is purchased in the marketplace for a price of \$8 per unit. The consumer spends all \$800 of her income on x because y is provided by the government, and no y market exists. The government is considering an increase in this consumer's allocation of y from $y_0 = 4$ to $y_1 = 9$. The price of x is assumed to be unaffected. Compute equivalent and compensating welfare measures for this change.

2. Considerable recent literature has addressed environmental problems and suggested the need for economic policies to "correct" what is perceived as a situation of economic inefficiency.

Imagine that you are charged with two tasks as part of your new job in a government agency:

- a) To provide an economic rationale for the intervention of the government into the economy for the purpose of influencing environmental problems (for example, air pollution from industrial emissions or water pollution from fertilizer and pesticide runoff); and
- b) Propose several specific types of economic policies which could be used to influence the creation and/or level of environmental problems caused by the market sector of the economy. (NOTE: Your discussion should describe how these policies would work, the advantages and disadvantages of each, and the degree to which they would use the market to solve its own problems.)
3. Exhaustible resources are often the subject of resource policy discussions. Discuss the issues which make such resources a concern for examiners of market processes and their "outcomes".

Your focus should be upon the economic character of these resources, how they "are" and "should" be allocated, and why the market may not be trustworthy in this regard.

Part II: Answer any one of the following two questions.

4. Do you support water allocation whereby water is allocated to its highest and best use? Be complete in your answer using economic theory and institutional concepts.
5. Floodplain property (land) is, by definition, periodically inundated by floods of differing severity. The larger the flood, the greater the damage, but larger floods occur less frequently. A small community has some homes, businesses, and industry located on a floodplain. This community is employing you to advise community leaders about the benefits of constructing a flood control structure. The proposed structure will fully contain lesser floods, reduce the damage caused by moderate floods, and have no impact in the case of large floods. Your charge is to estimate the expected benefits of flood control for the community. Discuss how you would do this and how you would present your results.