RESOURCES ECONOMICS PRELIMINARY EXAMINATION
January 22, 1988

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 your student ID number at the top of each page of your answers and do not write your name anywhere on the answers.

A. Answer both of the following two questions.

1. Within the past month an oil storage tank burst while it was being filled. The oil spilled into the Mongahella River of Pennsylvania and started to flow down it and into the Ohio River. Communities along the source of the river use it for a source of water for drinking and other activities. Clearly, there has been an economic impact.

   Imagine you are an economist with the Environmental Protection Agency. As you wake up for coffee this morning your supervisor informs you that you are to be in charge of the research group assigned to measure the economic impact of the oil spill. Your results will be used to determine whether (a) federal funds should be used for disaster relief (compensation for a large and unexpected impact), (b) how important it is for EPA to initiate detailed action, and possibly (c) whether a lawsuit will be initiated against Ashland Oil Company (owners of the storage tank) for compensation of the local areas affected. Clearly, the results of your work will be closely scrutinized by citizens and other interested parties.

   Given the above information, what would you do or assign your research team to do? And, how would you do it?

2. As an emergency measure to address the State's budget crisis, Texas is proposing a stiff tax on beer purchases. The beer tax will raise the cost of a six pack from \$2.56 to \$4.00. The average adult Texan has an income of Y = \$100 per week and has the following demand for six packs.

$$x = Y^{1/2} p^{-1/2}$$

   where x denotes six packs per week, Y is weekly income, and p is the price of a six pack.

a. Compute all appropriate Marshallian and Hicksian measures of consumer loss for the average adult.

b. The state economist contends that each dollar of tax revenues is used by the state to produce $2.30 of benefits. Use this information to perform an analysis of the above tax proposal. What should Texas do?

B. Answer any two of the following three questions.

1. Differentiate renewable resources from depletable (exhaustible) resources. Consider an increasing marginal cost depletable resource with no effective substitute: (i) Describe how the user cost for this resource in the earlier time periods would depend on whether the demand curve for that resource was stable or shifting over time (ii) How would the allocation of that resource over time be affected? Explain.

2. The most common means by which society deals with the inefficient allocation of resources to a public good is the creation of a public agency to provide that good. Unless we assume that public agencies achieve maximum efficiency through divine guidance, the possibility for misallocation of resources exists even after its creation. Please discuss the expected direction of this misallocation. Be sure to support your arguments with graphical and/or algebraic proofs where possible and with the underlying behavioral decision functions of the important actors. If neither the market nor public agencies allocate resources efficiently, what should we do?

3. Western rangeland is typically a publicly owned, renewable resource. Ignoring current rules and institutions, develop an economically attractive mechanism(s) for allocating rangeland to livestock producers and encouraging efficient production practices. Justify your selection. Do you contend that your plan offers important advantages over the current system? Why (not)?