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AFRICAN ECONOMIC RESEARCH CONSORTIUM

Collaborative MA Programme in Economics for Anglophone Africa (Except Nigeria)

JOINT FACILITY FOR ELECTIVES
JUNE – OCTOBER 2005

ENVIRONMENTALECONOMICS

Second Semester: Final Examination

Time: 09.00 AM – 12.00 Noon **Tuesday September 27, 2005**

INSTRUCTION: The examination is divided into two sections. Answer **ALL THREE** questions in Section A and any ONE question from section B. Questions in each section carry equal marks. Write legibly

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SECTION A

Question 1: Environmental Valuation Analysis

(a) Randall (1991), one of the recommended readings, leads us to believe that environmental economists fear that if benefits of environmental amenities are only linked to explicit and observable use then "something" might be overlooked in the benefit account. What are the candidates of the "something" that might be overlooked? State and elaborate on each of the candidates. *(7 marks)*

(b) Briefly discuss the nature and implications of the concept of environmentally compensating projects. *(7 marks)*

(Please turn to next page)

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Question 2: Environmental Policy Instruments

(a) Suppose you are given the total costs of abatement of the only two firms in the economy, A and B:

$TC_i = 100 + 0.5h_i a_i^2$

where i=A,B and a_i is the abatement level by firm i. Assume that h_A=1 and h_B=h. Demonstrate that the cost penalty from sharing abatement equally between the two firms rather than using the least-cost distribution of abatement is larger the greater is the difference in the firms' abatement marginal cost functions. Assume an abatement target of $2a$. ***(7 marks)***

(b) Drawing on "Deforestation from the overexploitation of wood resources as a cooking fuel" by Hassan and Hertzler (1999), one of the recommended readings, which economic policy instruments may be used to control deforestation in Sudan? ***(7 marks)***

Question 3: International Environmental Issues

(a) What are debt-for-nature swaps? Discuss their role and implications in relation to environmental problems in developing countries. ***(7 marks)***

(b) On a priori basis can you determine the environmental effects of international trade? Is trade therefore good to the environment? ***(7 marks)***

SECTION B

Question 4: Environmental Economics in General

(a) Describe the main stages of conducting a "state-of-the-art" contingent valuation study. You should use an example to enhance clarity. ***(6 marks)***

(b) At the start of 1998 oil reserves in Angola were 504 x 10^9 barrels. During 1998 Angola produced 8 x 10^9 barrels, and there were no new discoveries of oil there. The world price of oil was constant at \$3.125 per barrel throughout 1998, and the interest rate in Angola was also constant, at 5%. Total oil production costs in Angola, including a normal return on capital employed were \$20 x 10^9.

  (i) Calculate the depreciation of Angola's oil stock using

  - the net present value method

- El Serafy's user cost rule

(ii) Repeat (a) using an interest rate of 10%

(iii) Repeat the calculation for a 5% interest rate, but with the world price of oil being \$3.00 at the start of the year and \$5.00 at the end of the year.

(iv) Comment on your results. ***(6 marks)***

(c) The simplest version of the Coase theorem is said to claim that a unique and efficient allocation of resources would follow from rational bargaining, irrespective of how property rights were initially allocated. Demonstrate that the distribution of net gains between bargaining parties will, in general, depend upon the initial distribution of property rights. ***(6 marks)***

Question 5: Environmental Economics in General

(a) One of the main benefits of national parks is their biodiversity. Some African governments earn significant revenue from the viewing of birds and animals in these parks. How would you estimate the value from viewing a rare bird species such as the flamingo for a country such as Kenya using the travel cost method. In your answer comment on the appropriateness of consumer surpluses of tourists and citizens as measures of local welfare, which the African governments should ideally be maximising. ***(6 marks)***

(b) What is green accounting? Using an appropriate theoretical model in which non-renewable environmental resources are used in production, show the adjustments you would make to the GDP figure to convert it into sustainable income. ***(6 marks)***

(c) Describe the following policy instruments for environmental protection and comment on their applicability in solving any of your country's environmental problems:

(i) Deposit-refund systems

(ii) Safe minimum standard (SMS)

(iii) Voluntary agreements (VAs) ***(6 marks)***