



# **AFRICAN ECONOMIC RESEARCH CONSORTIUM**

## **Collaborative Masters Programme in Economics for Anglophone Africa (Except Nigeria)**

### **JOINT FACILITY FOR ELECTIVES (JFE) 2012**

**JUNE – SEPTEMBER**

## **ENVIRONMENTAL ECONOMICS I**

### **First Semester: Final Examination**

**Duration: 3 Hours**

**Date: Monday, August 6, 2012**

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#### **INSTRUCTIONS:**

1. You are required to answer **ALL** questions.
  2. The questions carry different weights as indicated against each. Questions 1 to 4 carry 15 marks each while questions 5 and 6 carry 20 marks each.
  3. You must answer all the questions clearly, briefly and neatly.
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#### **Question 1**

What are the main criticisms to EKC hypothesis? Does low turning point for the EKC have any connection with the notion of environmental sustainability? Please discuss and support your answer with some examples. **(15 points)**

#### **Question 2**

Three types of sustainability were compared in different literature. Describe them and indicate which one of the three can be achieved given the feature of natural resources used to support economic development. **(15 points)**

#### **Question 3**

Outline and describe the core and structural factors that affect cooperation in the management of the commons. Could the effect of these factors shift based on the attributes of natural resources? Discuss by giving examples from your own experiences. **(15 points)**



#### Question 4

Use a graph to indicate a steady-state situation and its distinction and overlap with the maximum sustainable yield in a renewable resource harvesting. Then, describe the economic and non-economic factors that can affect the realization of the maximum sustainable yield? What kinds of policies need to be introduced to attain this? Please provide examples in discussing the role of each factor. **(15 points)**

#### Question 5

Assume that country **A** has discovered an oil deposit of total quantity 40 bbl and wants to allocate the resource for two periods using a discount rate of 15%. The willingness to pay function and marginal extraction costs remain constant in both periods where  $P = 20 - 0.5q$  with marginal extraction cost (MEC) equals \$5 per barrel. Based on this information and assuming a *dynamically efficient* resource allocation setting:

- a) How much resource should be allocated to current period? **(4 points)**
- b) How much should be allocated to the future period? **(4 points)**
- c) What is the net social benefit for the two periods? **(4 points)**
- d) While the demand for the oil remaining unchanged, could a decline in MEC by 40% due to technological change affect efficiency in allocations? Please indicate the answers using graphs. **(4 points)**
- e) What can you conclude from your answer on the effect of technological change? **(4 points)**

#### Question 6

Suppose the demand function (D), marginal production cost (MPC) function and the marginal external effects (MEE) function of a farmer who has invested in beekeeping are as follows:

$$\begin{aligned} D: p &= 40 - 0.5q \\ MPC &= 5 + 0.3q \\ MEE &= 10 + 0.1q \end{aligned}$$

Given this information,

- a) What are the privately and socially efficient rates of production? **(7 points)**
- b) Looking at your result, what type of externality do you deduce and why? **(7 points)**
- c) What kind of advice should an expert give to a policymaker so that the farmer will be socially efficient? **(6 points)**