



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY
EXAMINATIONS
2018/2019 ACADEMIC YEAR
FOURTH YEAR FIRST SEMESTER**

**SCHOOL OF BUSINESS &
ECONOMICS
BACHELOR OF SCIENCE IN
AGRICULTURAL ECONOMICS**

**COURSE CODE: ARE 442
COURSE TITLE: ENVIRONMENTAL
ECONOMICS**

DATE: 29TH APRIL 2019
HRS

TIME: 8.30 -10.30

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other **THREE** questions

over.

This paper consists of 4 printed pages. Please turn

QUESTION ONE

(i) Suppose that a wood pulp mill is situated on a bank of the River X. The private marginal cost (MC) of producing wood pulp (in Shs per ton) is given by the function $MC = 10 + 0.5Y$ where Y is tons of wood pulp produced. In addition to this private marginal cost, an external cost is incurred. Each ton of wood pulp produces pollutant flows into the river which cause damage valued at Sh10. This is an external cost, as it is borne by the wider community but not by the polluting firm itself. The marginal benefit (MB) to society of each ton of produced pulp, in Sh, is given by $MB = 30 - 0.5Y$

(a) Draw a diagram illustrating the marginal cost (MC), marginal benefit (MB), external marginal cost (EMC) and social marginal cost (SMC) functions.

3mks

(b) Find the profit-maximizing output of wood pulp, assuming the seller can obtain marginal revenue equal to the marginal benefit to society derived from wood pulp.

2mks

(c) Find the pulp output which maximizes social net benefits. 2mks

(d) Explain why the socially efficient output of wood pulp is lower than the private profit maximizing output level.

2mks

(ii) Discuss any TWO broad types of institutional arrangement for managing aquifers.

4mks

(iii) Discuss the operations of transferable/marketable emission permits.

6mk

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- (iv) Explain travel cost method and hedonic price method techniques of environmental valuation.

6mks

QUESTION TWO

- (i) Explain the concept of the 'efficient level of pollution'.

2mks

- (ii) Evaluate the arguments for the use of market or incentive-based instruments versus 'command and control' instruments in the regulation of environmental externalities under conditions of certainty.

6mks

- (iii) Discuss the contention that contingent valuation is, in general, superior to all other techniques for valuing non-marketed goods or services as it is the only technique capable of incorporating non-use values as well as use values.

4mks

- (iv) Discuss the argument that poor people are the main victims of a bad environment.

3mks

QUESTION THREE

- (i) While some economists argue for the creation of private property rights to protect the environment, many of those concerned for the environment find this approach abhorrent. What are the essential issues in this dispute?

4mks

- (ii) 'A clean environment is a public good whose benefits cannot be privately appropriated. Therefore private industry which is run for private gain will always be the enemy of a clean environment.' Examine this proposition.

4mks

- (iii) Externality is one of the causes of environmental goods market failure. Discuss any TWO causes of environmental

good market failure.

4mks

(iv) Explain the policy opportunities to reduce poverty and improve environment.

3mks

QUESTION FOUR

(i) By an illustration, discuss the effectiveness of liability laws in controlling third party effects of production and consumption. **8mks**

(ii) Discuss any TWO pricing policies for surface water allocation. **4mks**

(iii) Economists see pollution problems as examples of the class of adverse externality phenomena. An adverse externality is said to occur when the decisions of one agent harm another in an unintended way, and when no compensation occurs. Does this mean that if a pollution source, such as a power station, compensates those affected by its emissions, then there is no pollution problem? **3mks**

QUESTION FIVE

(a) Should decisions about environmental policy be made on the basis of cost-benefit analysis?

3mks

(b) Consider the two social welfare functions

$WU = U(1) + U(2)$ (utilitarian)

$WR = \min\{U(1), U(2)\}$ (Rawlsian)

where $U_i = \ln(X_i)$ is the utility enjoyed by the i th generation from the consumption X_i , $i=1, 2$.

Consider two projects:

Project A: Generation 1 reduces consumption by 10 units.

The investment yields 20 additional units of consumption for Generation 2.

Project B: Generation 1 reduces consumption by 15 units. The investment yields 15 additional units of consumption for Generation 2. Let the pre-project level of consumption in Generation 1 be 100 units.

Now consider three scenarios:

Scenario Pre-project level of X_2

(i) No technology change 100

(ii) Technology improvement 120

(iii) Technology worsening 80 (or loss of inputs)

Show whether the project (A or B) should be undertaken under each of the three scenarios, for the two cases of a utilitarian SWF (U) and a Rawlsian SWF (R).

6mks

(c) Discuss any THREE types of economic benefits that water provides.

6mk

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