

NATIONAL UNIVERSITY OF LESOTHO

B.A. EXAMINATIONS

EC4307: ENVIRONMENTAL ECONOMICS

JANUARY 2024

MARKS: 100

TIME: 3 HOURS

INSTRUCTION

Answer question **ONE** and any **THREE** questions.

QUESTION 1

Discuss how a contingent valuation survey was conducted in trying to assess the potential for a typical large African park such as the Kruger National Park to generate additional revenue through an entrance fee hike. Further indicate how unique African parks such as the Kruger National Park can contribute to African economies through revenues from increased entrance fees. (25)

QUESTION 2

Discuss the different views of economics schools of thought towards environmental paradigms and history of environmental economics. Start with the three basic economics schools of thought and three schools of thought directly relating to the environment. (25)

QUESTION 3

Efficiency in resource allocation requires three efficiency conditions to be fulfilled: (efficiency in consumption, efficiency in production, product-mix efficiency). Use assumptions that the economy has two individuals (**A and B**) each consuming two commodities (**X and Y**), where each commodity is produced by an industry comprising two firms (**1 and 2**), each of which uses two inputs, capital (**K**) and labor (**L**).

- a) Assuming that all three conditions are met, introduce a social welfare function, and derive the conditions that characterize an optimal allocation. (15)
- b) Show how the existence of a consumer-to-consumer externality led to market failure. (10)

QUESTION 4

- a) Suppose that there is a climate change problem affecting Lesotho and South Africa, each country faces a choice of whether to abate pollution or not. Pollution abatement is assumed to be a public good so that abatement by either country benefits both. Abatement comes at a cost of 7 million to the abater, but confers benefits of 5 million to both countries. If both abate, both experience benefits of 10 million and each experiences a cost of 7million.

- i) Can this kind of a game be used to solve the climate change problem? (5)
 - ii) Show the pay-off matrix to this game and identify the dominating strategy. (5)
- b) Most international environmental problems involve several countries. Let be the number of countries affected by climate change problems to be identical.
- i) Construct the payoff matrix when only 10 countries are involved. (8)
 - ii) Using the structure of the pay-offs in (i), identify dominating strategy with the help of the diagram. (7)

QUESTION 5

- a) Suppose that government of Lesotho has a problem with pollution in rivers and lakes, from both residential and industrial sources. You are asked to advice on appropriate pollution control policies.
- i) How would you decide on which pollution control policy the government of Lesotho should adopt? (5)
 - ii) With the help of diagrams and relevant Lesotho examples, discuss two pollution control policies which will be more appropriate to solve this pollution problem. (15)
- b) Explain how the production function approach might be used to infer the value that individuals place on their production function. (5)

QUESTION 6

- a) Define the concept of valuation in environmental economics and why we study environmental valuation. (5)
- b) Discuss valuation techniques you would recommend to measure the value of the following:
- i) Preserving a tropical rain forest. (5)
 - ii) The quality of air around Thetsane Industrial Area. (5)
 - iii) Mitigating global warming. (5)
- c) Discuss why Coase Theorem is more applicable in controlling (iii) above. (5)