NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES
SCHOOL OF AGRICULTURE AND NATURAL RESOURCES SCIENCES
DEPARTMENT OF AGRICULTURAL SCIENCES AND AGRIBUSINESS

QUALIFICATIONS: BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATIONS CODE: 07BAGA	**LEVEL: 7**
COURSE CODE: ENR721S	**COURSE NAME:** Environmental and Natural Resources Economics
DATE: JANUARY 2025	**PAPER:** 2
DURATION: 3 HOURS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER:	DR. TEOFILUS SHIIMI
MODERATOR:	DR. SEAN KALUNDU

INSTRUCTIONS

1. Answer all the questions.
2. Write neatly and clearly.
3. Mark all answers clearly with their respective question numbers.
4. All written work MUST be done in blue or black ink.
5. No books, notes and other additional aids are allowed.

PERMISSIBLE MATERIALS

1. Calculator
2. Examination paper
3. Examination script

THIS QUESTION PAPER CONSISTS OF 2 PAGES
(Excluding This Front Page)

Question 1

a. Using the materials balance model, briefly explain how each of the following factors will affect the environmental health and quality: [6]

i. population growth
ii. Increased industrial of reuse & recycling
iii. Introduction of pollution reduction technologies

b. Explain the following concepts making reference to environmental standards: [6]

i. Ambient standard
ii. Performance-based standard
iii. Technology-based standard

c. By definition, differentiate the following terminology [8]

i. Natural pollutants and Anthropogenic pollutants
ii. Local pollution and regional pollution
iii. Environmental quality and Sustainable development
iv. Command-and-control approach and Market approach

Sub-Total: 20 Marks

Question 2

a. Define the Coase Theorem. [2]
b. Discuss two limitations of the Coase Theorem. [4]
c. Explain nonrivalness means to you as a characteristic of a public goods. [2]
d. Discuss four limitations of environmental standards from an allocative efficient perspective. [8]
e. Discuss two motives behind the introduction of natural environmental policies in the management of the environment. [4]

Sub-Total: 20 Marks

Question 3

a. Suppose the following functions represents the market demand and supply for cups made from recycled materials; $Q_d = 200 - 2P$ and $Q_s = 5P - 150$, respectively. Where P is the price per ton and Q is the quantity in thousands of tons per year.

i. Based on these equations, determine the equilibrium quantity (QE) and price (PE) of cups made from recycled materials [4]

ii. Graphically illustrate the cups made from recycled materials market based on the supply and demand equations given. Provide numerical labels for the equilibrium price and quantity. [4]

iii. Suppose that because of market changes, the selling price of cups made from recycled materials is N$35 per ton. At this price level, is the market in an equilibrium, shortage, or surplus condition? Be sure to support with specific values. [4]

iv. With your economic understanding of the supply and demand function in the competitive market, explain why a shortage or surplus occurred with the market change that happened in **Question 3. A.iii.** [3]

v. Explain what happened to the quantity of cups supplied when the price changed from the initial equilibrium to the new price of N$35 per Ton. [3]

vi. Discuss what happened to the size of the consumer surplus when the price of cups made of recycled material moved from the initial equilibrium price to N$35/ton. [2]

Sub-Total: 20 Marks

Question 4

a. Suppose an abattoir is releasing pollution into a nearby aquafer, and the associated health and ecological damages are not considered in the private market for meat. Suppose you are Policy Analyst working for the Ministry of Environment Forest and Tourism, and you have estimated the following marginal benefits and costs for the meat market.

$MPB = 900 - 0.5Q \qquad MPC = 100 + 0.3Q \qquad MEC = 0.8Q$

Where Q is the quantity in thousands of carcases produced and P is the price per carcase.

i. Estimate the quantity and price when the market is in competitive equilibrium. [2]

ii. Estimate the quantity and price when the market is in efficient equilibrium. [4]

b. Suppose that two firms, X and Y, face the following abatement costs:

Firm 1 → $\mathrm{MAC_X} = 1.8\mathrm{A_X}, \mathrm{TAC_X} = 0.9(\mathrm{A_X})^2$

Firm 2 → $\mathrm{MAC_Y} = 1.2\mathrm{A_Y}, \mathrm{TAC_Y} = 0.6(\mathrm{A_Y})^2$

Further assume that the combined abatement standard is 60 units for both firms. Use this information to answer the questions below.

i. Prove that a uniform standard will not meet the cost-effectiveness criterion. [4]

ii. Determine how the abatement levels should be reallocated across the two firms to minimize costs [6]

iii. Estimate the cost savings associated with the cost-effective solution compared to a uniform standard. [4]

Sub-Total: 20 Marks

Question 5

a. Explain the following concepts within the context of environmental policy planning: [6]

i. Voluntary and involuntary risk
ii. Risk assessment
iii. Risk management

b. Describe the ecological risk assessment process. [6]

c. Discuss two major tasks aimed by the implementation of the risk management process. [4]

d. "Risk characterization is the final step of risk assessment, which is the objective of the entire process" Discuss what is expected to be the content of the risk characterization. [4]

Sub-Total: 20 Marks

End!