MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF AGRICULTUREAND ENVIRONMENTAL SCIENCES

DEPARTMENT OFAGRICULTURAL SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

FOURTH YEAR **SECOND** SEMESTER EXAMINATION FOR BACHELOR

OF SCIENCE IN AGRIBUSINESS MANGEMENT AND ENTERPRISE DEVELOPMNET

GAE416: ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question one and any other two questions.

2. Mobile phones are not allowed in the examination room.

3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a. Differentiate between the following terms

    i.   Renewable and non-renewable resource   (2 marks)

    ii.   Excludable and non-excludable resources   (2 marks)

    iii.   Public and private goods   (2 marks)

b. Explain how the private benefit and marginal social benefit differs when using public and private good use suitable illustrations.   (10 marks)

c. Explain the policy measures that a government can use to regulate the use of a common good. Use illustration to support your explanation.   (8 marks)

d. Explain the causes of market failures.   (8 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a. Explain the use of price control a strategy to control the exploitation of nature resource.

                                                         (6 marks)

b. Explain how price control affects the production and composition of a depletable recourse. State the assumption that must be considered under a given exploitation and recourse regime give assumption on.   (9 marks)

    i.   Marginal extraction

    ii.   Marginal cost

    iii.   Exploration

    iv.   Technologies progress

QUESTION THREE (20 MARKS)

a. Describe allocation regimes and their resultant affects assuming a positivity sloppy supply curve and supply with and without vulnerability premiums.   (10 marks)

b. Explain why self-sufficient allocation led to efficient losses.   (5 marks)

QUESTION FOUR (20 MARKS)

A recently planted forest (t=0) has price p. The merchantable volume of timber at T≥0 is given by

$QT = AT + BT^2 + GT^3$

Where

A=10

B=1

G=0.01

Required:

i.   Calculate the maximum volume of timber and when does it occur.   (2 marks)

ii. What rotation length maximizes the mean increment (Q_t/t) and what is the associated volume.   (2 marks)

iii. If the next price per unit is p=1 ad the discount pale d=o.5, what are the optional single rotation TS volume at harvest, and present value at t=0.   (4 marks)

iv. If the cost of replanting c=150, what is the optional Faustman rotation T* volume at harvest and present value at t =0   (4 marks)

v.   If price increases to p=2, what are the new values for T_s and T*. Do the new values make sense relative to their value when p=1?   (5 marks)