namibia university
of science and technology

FACULTY OF NATURAL RESOURCE AND SPATIAL SCIENCES
DEPARTMENT OF AGRICULTURE & NATURAL RESOURCES SCIENCES

QUALIFICATION: BACHELOR OF AGRICULTURE/BACHELOR OF REGIONAL AND RURAL DEVELOPMENT	
QUALIFICATION CODE: 27BAGR/07BRRD	**LEVEL:** 5
COURSE CODE: AEM520S	**COURSE NAME:** AGRICULTURAL ECONOMICS
DATE: January 2020	**PAPER:** THEORY
DURATION: 3 Hours	**MARKS:** 100

INSTRUCTIONS
1. Answer ALL four (4) questions.
2. Read all the questions carefully before answering.
3. Number your answers.
4. Make sure your student number appears on the answering script.

PERMISSIBLE MATERIALS

1. Examination paper.
2. Examination script.
3. Calculator

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

QUESTION ONE	**[MARKS]**

a. Explain the four basic economic concepts that are used to analyze and understand individual choices. (4)

b. The study of Agricultural Economics involves the use of theories, models, and concepts as aids for analyzing and understanding complex relationships and phenomena in the real world. Comparative Advantage is one such concept. What is comparative advantage? Describe how you would use the concept of comparative advantage to explain trade between within or between countries. (6)

c. Consider the market for imported onions by the following demand and supply functions:

$$P = 4000 - 0.2Q$$

$$P = 1000 + 0.8Q$$

Where P is the market price of onions (in N$ per ton), and Q is the quantity demanded and supplied of imported onions.

    i. State the price range in which imported onions will be sold and bought in the market. (2)

    ii. Suppose the government, suppose the government sets the price of imported onions at N$ 2000 per ton. Would this price control create a shortage or surplus in the market? Calculate the magnitude of the shortage or surplus in the market. (4)

    iii. Estimate the benefits in monetary terms that would accrue to the consumers as a result of the price control. (5)

    iv. Compute the cost of this price control on the Namibian society. (*hint: the cost of the price control is the deadweight loss*) (4)

TOTAL MARKS **[25]**

QUESTION TWO   **[MARKS]**

a. Discuss the application and use of the elasticity concept in economics. Your discussion
    should focus on the application and use of the elasticity in the assessment of the
    responsiveness of consumers to changes in income, prices, and prices of related
    goods.

    (10)

b. Explain how you would use the market model to assess the desirability of a tax policy
    from an economic efficiency perspective.

    (5)

c. Suppose you are the Policy Analyst at the Ministry of Agriculture, and you have been
    tasked to analyze and quantify the responsiveness of consumers to the introduction
    of an N$500 excise tax on each ton of imported onions. Suppose you know that the
    monthly demand and supply of imported onions, before the introduction of the tax,
    can be represented by the following functions.

$$P = 4000 - 0.2Q$$

$$P = 1000 + 0.8Q$$

Where P is the market price of onions (in N$ per ton), and Q is the quantity demanded
and supplied of imported onions. Use this information to answer the questions below.

    i.   Determine the equilibrium price and quantity before the introduction of the
         excise tax.

         (2)

    ii. Estimate the equilibrium price and quantity after the introduction of the
         excise tax.

         (2)

    iii. Estimate the price elasticity of demand between the equilibrium price before
         and after the introduction of the excise tax. Is the demand for imported onions
         elastic, unit elastic, or elastic? Show all your calculations and explain your
         answer.

         (6)

TOTAL MARKS   **[25]**

QUESTION THREE   [MARKS]

a. What is an indifference curve? State any three properties of indifference curves for ordinary goods.

(4)

b. In consumer theory, consumer preferences are assumed to be complete and transitive. Explain what these concepts mean.

(4)

c. Explain the income effect and substitution effect of a price change on the consumer's consumption bundle. Furthermore, explain the relationship between income effect and substitution effect for normal, inferior, and Giffen goods.

(6)

d. Consider a rational consumer, whose consumption bundle is composed of two goods, food, and clothes. One a monthly basis, the consumer has an income of N$5000 that he spends on food and clothes. The prevailing prices of food and clothes are N$100 per unit and N$200 per unit, respectively. Suppose the following function represents the utility that a consumer gets from consuming different units of food and clothes:

$$U = 2x_1^2 x_2^3$$

Where U represents the total utility that the consumer gets from consuming bundles containing different units of food and clothes; x_1 is the units of food per month, and x_2 represents the units of clothes per month. Based on this information answer the questions below:

   i. Determine the units of food and clothes in the consumer's optimal consumption bundle.

(5)

   ii. Suppose the price of food increased to N$200 per unit *ceteris paribus* (i.e., income and the price of clothes remained constant). Estimate the impact of this price change on the utility of the consumer. (*Hint*: impact is estimated as the difference in the consumer's utility before and after the price change).

(6)

TOTAL MARKS   **[25]**

QUESTION FOUR   **[MARKS]**

a. State any four characteristics of a monopoly market structure.   (4)

b. The theory of firm behavior states that Monopolies have market power. What does this mean? Explain how monopolies are created.   (4)

c. Consider a small-scale farmer who is operating a tomato production enterprise. Given that there are many producers of tomatoes and that tomatoes are undifferentiated, the farmer is operating in a perfect competitive industry. Suppose the current price of tomatoes is N$120 per box, and the following function represents the farmer's total cost for producing tomatoes:

$$TC = 200 + 40Q + 2Q^2$$

Where TC is the total cost, and Q is the number of tomato boxes. Both TC and Q are measured in thousands.

  i. Derive the mathematical expressions for the farmer's variable cost, average total cost, average fixed cost, and marginal cost functions.   (4)

  ii. Determine the farmer's efficient scale, break-even price per box, and optimum output level.   (7)

  iii. Estimate the farmer's total cost, total revenue, and profit, when he produces the optimum output level.   (6)

TOTAL MARKS   **[25]**

THE END