



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR
FIRST YEAR FIRST SEMESTER**

**SCHOOL OF BUSINESS AND ECONOMICS
MSC. ECONOMICS, MSC. AGRICULTURAL
ECONOMICS**

COURSE CODE: ECO 8101

COURSE TITLE: MICROECONOMICS

DATE: 31/1/2024

TIME: 1430-1630 HRS

INSTRUCTIONS TO CANDIDATES

1. Answer **QUESTION ONE AND ANY FOUR** questions

*This paper consists of **THREE** printed pages. Please turn over.*

QUESTION ONE (20 MARKS)

- a) Suppose that a consumer's utility function for goods x , y and z is of the Cobb-Douglas form;

$$U(x, y, z) = x^{0.5}y^{0.5}(1 + z)^{0.5}$$

Prices are given as $P_x=1$, $P_y=4$, and $P_z=8$. Consumer income is given by $I=8$.

Determine the utility maximizing quantity of good x , y and z consumed.

(6 Marks)

- b) Explain the methods we can use to reduce risk and uncertainty.

(6 marks)

- c) DEVKI Steel Mills EPZ Ltd. produces high quality steel for steel at its plant in Ruiru, Kenya for sale throughout the East African Region. The cost function for steel production (q) is given by:

$$TC = 0.1q^2 + 100$$

Steel is only demanded in Uganda (UG) (where the demand curve is given by $q_{UG} = 50 - 2P_{UG}$) and Tanzania (TZ) where the demand curve is given by $q_{TZ} = 75 - 3P_{TZ}$). Total demand equals $q = q_{UG} + q_{TZ}$.

- i) If DEVKI Steel Mills EPZ Ltd. can control the quantities supplied to each market, how much should it sell in each location to maximize total profits? **(4 Marks)**
- ii) What price will be charged in each location? **(2 Marks)**
- iii) What is the total profit that DEVKI Steel Mills can generate?

(2 Marks)

QUESTION TWO (20 MARKS)

- a) Sometimes governments may seek to control prices at below equilibrium levels. Although adoption of such policies may be based on noble motives, the controls deter long-run supply responses and create welfare losses for both consumers and producers. Elucidate.

(6 Marks)

- b) The demand and supply functions of a two commodity-market model are as follows:

$$Qd_1 = 180 - 3P_1 + 2P_2$$

$$Qs_1 = -2 + 54P_1$$

$$Qd_2 = 122 + P_1 - 2P_2$$

$$Qs_2 = -72 + 7P_2$$

Find the market clearing values for both markets using fractions rather than decimals **(8 marks)**

- c) Given that the forces of supply and demand can establish equilibrium prices in the general equilibrium model of exchange we have developed, it is natural to ask what are the welfare consequences of this finding. Explain the first and second theorems of welfare economics graphically. **(8 Marks)**

QUESTION THREE (20 MARKS)

- a) Consider a game where, for a fixed amount of money paid in advance, you can throw a die and collect KES 1500, if an odd number shows up, or KES 2500 if the number is even.
- By use of diagrams explain the player's possible attitudes towards risk. **(4 marks)**
 - Calculate the expected value of the payoff **(2 Marks)**
- b) Explain the Neumann-Morgenstern utility function with appropriate assumptions. **(6 marks)**
- c) Given the following profit function $\pi = 1000q - 24q^2$ find the local maximum and proof that it is indeed a local maximum. **(4 marks)**
- d) Elucidate the axioms of rational choice with examples. **(4 Marks)**

QUESTION FOUR (20 MARKS)

- a) What is substitution effect? Explain slusky's substitution effect. **(5 Marks)**

- b) Explain the inductive and deductive methods of economic study. Compare and contrast. **(6 Marks)**
- c) The demand curves of a price discriminating monopolist are defined by the following functions in two markets:

$$Q_1 = 20.5 - \frac{1}{4}P_1$$

$$Q_2 = 90 - 3P_2$$

If the monopolist's Total Cost Function is given as:

$$TC=70+9Q$$

- i. Determine the selling prices and quantities of Q in the two markets. **(5marks)**
- ii. What is the firm's profit? **(4 Marks)**

QUESTION FIVE (20 MARKS)

- a) Explain the welfare effects of a monopoly graphically. **(6 Marks)**
- b) Suppose that two firms produce toothpaste, one a green gel and the other a white toothpaste. Suppose also that the production is costless. The market demand for product i is:

$$q_i = a_i - p_i + \frac{p_j}{2}$$

Where p_i is good's own price and p_j is the other good's price.

- i. Solve for p_i to get the best response functions for $i = 1,2$ **(2 marks)**
- ii. Determine the Nash Equilibrium prices and the associated profits **(6 Marks)**
- c) What is elasticity of demand. Discuss its kinds with relevant mathematical formulae. **(6 Marks)**

QUESTION SIX (20 MARKS)

- a) Compare and contrast the St. Petersburg Paradox and the Bernoulli's solution in detail. **(6 marks)**
- b) Suppose that John has a current wealth of KES 1,800,000 and faces a prospect of a 33% chance of losing his KES 950,000 lorry to theft in the

coming year. Suppose that John's von-Neumann-Morgenstern utility function is logarithmic; i.e. $U(W) = \ln W$.

- i. Calculate John's Expected Utility without insurance for the coming year. **(2 Marks)**
 - ii. Calculate John's Expected Utility with a fair insurance for the coming year. **(2 Marks)**
 - iii. Determine John's maximum insurance premium **(3 marks)**
 - iv. Determine John's maximum administrative costs that he would be willing to pay. **(2 marks)**
- c) Suppose the utility function of goods x and y is given by;

$$U(x, y) = xy + y$$

- i. Calculate the uncompensated (Marshallian demand functions for x and y and describe how the demand curves for x and y are shifted by changes in income I or the price of the other good. **(2 marks)**
- ii. Calculate the expenditure function for x and y **(3 marks)**

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