

**UNIVERSITY OF SWAZILAND
FACULTY OF SOCIAL SCIENCE
DEPARTMENT OF ECONOMICS**

MAIN EXAMINATION

DECEMBER 2011

TITLE OF PAPER: INTERMEDIATE MICROECONOMIC THEORY
COURSE CODE: ECON 302
TIME ALLOWED: THREE (3) HOURS

- INSTRUCTIONS:**
- 1. ANSWER THREE (3) QUESTIONS:
QUESTION ONE(1) IS COMPULSORY AND YOU CAN THEN CHOOSE ANY TWO (2) QUESTIONS FROM THE REMAINING FOUR (4) QUESTIONS PROVIDED.**
 - 2. QUESTION 1 CARRIES 50 MARKS AND THE CHOSEN TWO QUESTIONS CARRY 25 MARKS EACH**

THIS PAPER IS NOT SUPPOSED TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR

QUESTION 1 (Compulsory)

a) Write short explanatory notes on the following: (5 marks each)

- i) Properties of an expenditure function
- ii) Commodity substitution in consumer theory

b) Given the following utility function: $U = 3\sqrt{x_1^2 x_2^2}$

- i) Derive the compensated demand functions (10)
- ii) Derive the ordinary demand functions (10)
- iii) Derive the indirect utility function (5)
- iv) Derive the expenditure function (5)
- v) Using the appropriate theorem find the marshallian demand function for good 2. (5)
- vi) Using the appropriate theorem find the hicksian demand function for good 2. (5)

QUESTION 2

a) Suppose that the production function for widgets is given by

$$Q = KL - 0.8K^2 - 0.2L^2$$

Where Q represents the annual quantity of widgets produced, K represents the annual capital input, and L represents the annual labor input.

- i) Suppose $K=10$; calculate the total and average productivity of labor. At what level of labor input does this average productivity reach a maximum? How many widgets are produced at that point? (8)
 - ii) Again assume that $K = 10$, calculate the MP_L curve. At what level of labor input does $MP_L = 0$? (5)
 - iii) Suppose capital inputs were increased to $K = 20$. How would your answer to parts i) and ii) change? (6)
 - iv) Does the widget production function exhibit constant, increasing, or decreasing returns to scale? (3)
- b) Differentiate between economic costs and opportunity costs (3)

QUESTION 3

- a) Discuss the type of relationship that exists between total cost, marginal cost and average cost curves of a firm that is experiencing both decreasing and increasing returns to scale. (15)
- b) Prove mathematically that the least cost input combination is attained where the isocost line and isoquant are tangent to each other ($MRTS_{LK} = w/r$). You may also show this relationship in a diagram. Suppose that you are given the following functions: $C = wL + rK$ and $Q = f(L,K)$. (10)

QUESTION 4

- a) Assume that two firms in Matsapha produce Mabele -meal that tastes the same. The first firm is Ingwe Milling and the other firm is Top- Score Milling. The profits of each firm depends on its own output and that of the rival/competitor's firm and these are expressed as:

$$\pi_1 = 24q_1 - q_1^2 - 2q_2^2 - 8$$

$$\pi_2 = 30q_2 - 3q_2^2 - 2q_1 - 9$$

- i) What will be the output level of each firm. (8)
- ii) Derive the profits for each firm (4)
- iii) Calculate the firm's profit and output levels if instead the two firms collude in order to maximize joint profits. (6)
- b) Differentiate between the Cournot behavior and the Bertrand behavior (7)

QUESTION 5

Write short explanatory notes on the following concepts:

(5 marks each)

- i) A pure exchange economy
- ii) Walras Law
- iii) Gross demand
- iv) Final allocation
- v) Walrasian equilibrium