UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: BSc. in Agricultural Economics and Agribusiness Management Year IV

COURSE CODE: AEM 411

TITLE OF PAPER: Production Economics

TIME ALLOWED: 2:00 Hours

INSTRUCTION: 1.ANSWER ANY 4(four) QUESTIONS
               2. Each question carries 25 marks.

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR

Question 1

Using examples, give short explanatory notes on how the following key terms may be used in production economics:

a. Short-run
b. The "law of diminishing marginal returns"
c. Efficient production
d. Marginal rate of substitution
e. Isoquants

(5 marks each)

Question 2

i. A firm operating under conditions of perfect competition has a total cost function given by: $TC = 10 + 5Q^2$ with a market price of $50. Calculate the amount of quantity that maximizes profit (5 marks)

ii. The total cost function is $TC = 2Y - 2Y^2 + Y^3$

a) Find the average variable cost function
b) Find the level of Y where the AVC is at the minimum
c) Find the marginal cost function
d) Show that at the minimum of average cost, average cost is equal to marginal cost

[5 marks each]

Question 3

a. With the help of a diagram or diagrams, illustrate the classical production function, APP and MPP, and carefully delineate the three stages of production (20 marks)

b. Why is stage II regarded as an economic stage? (5 marks)

Question 4

i.   Suppose a given product is produced using two inputs X_1 and X_2. The production function is:

$Y = 18X_1 - X^2_1 + 14X_2 - X^2_1$

The price of the product is E2.00. The price of X_1 is E8.00 and the price of X_2 is E4.00. Answer the following questions and clearly show all your work.

     a. Find the combination of the two inputs that will maximize profit
   (4 marks)
     b. Find the equation of the expansion path with X_1 on the left-hand side.
   (4 marks)
     c. Show that the value of Y at which profit is maximum lies on the
   expansion path. (4 marks)

ii. Suppose that 200 counts of a given product can be produced by two units.
   If the prices of the two units are equal, would it be correct to employ
   equal amounts of the two inputs to produce the 200 units of this product?
   Explain your answer with the help of a well labeled diagram. (13 marks)

Question 5

Suppose we have a monopolist who faces the following demand (or average revenue) functions:

$P = 140 - 2Q$
$TC = 10 + 10 + 5Q^2$

     a. Calculate the quantity at profit (Π) maximization. (8 marks)
     b. What is the profit maximizing price for this monopolist? (3
   marks)
     c. What is the profit at the level of quantity produced in (a) above?
   (6 marks)
     d. Let the profit constraint be $20. Calculate the quantity that
   maximizes profit. (8 marks)