UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: BSc. in Agricultural Economics and Agribusiness
Management

COURSE CODE: AEM 405 / AEM 411

TITLE OF PAPER: PRODUCTION ECONOMICS

TIME ALLOWED: TWO HOURS

INSTRUCTION: 1.   ANSWER ALL QUESTIONS
2.   EACH QUESTION CARRIES TWENTY FIVE (25)
MARKS

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

Question One

(a) Suppose the average variable cost function of some farm is given by:
$AVC = 30 - 3.6Y + 0.2Y^2$, where Y is output.

(i)   What is its marginal cost function?   **(3 MARKS)**

(ii)   Suppose this farm is operating in a perfectly competitive market where the price of Y is E30.00. How much quantity should the manager produce and sell in the market? Show all workings and justify your answer.   **(12 MARKS)**

(b)   Suppose you are given the following production function: $Y = 2X^{1/4}$, where Y is output and X is capital input. Suppose the fixed cost is E500 and the price of the capital input is E16.

(i) Derive the total cost, marginal cost and average cost functions   **(6 MARKS)**

(ii) What are the values of the functions derived in (i) when Y=100?   **(4 MARKS)**

Question Two

(a) Write short notes on: expansion path, isoquants, ridge lines, isocost lines and iso-revenue lines   **(10 MARKS)**

(b) Differentiate among the following: elasticity of substitution, marginal rate of input substitution and elasticity of production.   **(6 MARKS)**

(c) Briefly discuss the general profit maximization for a factor-product model with respect to necessary and sufficient conditions.   **(9 MARKS)**

Question Three

(a) Given the following production function: $Y = X_1^{0.3}X_2^{0.7}$

Find the expansion path function when the prices are E1.00 and E2.00 for X_1 and X_2 respectively.   **(6 MARKS)**

(b) Suppose the production function is $Y = X_1X_2$ and you have E200 to spend on the two inputs. If the price of X_1 is E1.00 and the price of X_2 is E2.00, how can you combine the two inputs in the production of Y?   **(6 MARKS)**

Question One

(a) Suppose the average variable cost function of some farm is given by:
$AVC = 30 - 3.6Y + 0.2Y^2$, where Y is output.

    (i)   What is its marginal cost function? **(3 MARKS)**

    (ii)   Suppose this farm is operating in a perfectly competitive market where the price of Y is E30.00. How much quantity should the manager produce and sell in the market? Show all workings and justify your answer. **(12 MARKS)**

(b) Suppose you are given the following production function: $Y = 2X^{1/4}$, where Y is output and X is capital input. Suppose the fixed cost is E500 and the price of the capital input is E16.

    (i) Derive the total cost, marginal cost and average cost functions   **(6 MARKS)**

    (ii) What are the values of the functions derived in (i) when Y=100?   **(4 MARKS)**

Question Two

(a) Write short notes on: expansion path, isoquants, ridge lines, isocost lines and iso-revenue lines **(10 MARKS)**

(b) Differentiate among the following: elasticity of substitution, marginal rate of input substitution and elasticity of production. **(6 MARKS)**

(c) Briefly discuss the general profit maximization for a factor-product model with respect to necessary and sufficient conditions. **(9 MARKS)**

Question Three

(a) Given the following production function: $Y = X_1^{0.3}X_2^{0.7}$
Find the expansion path function when the prices are E1.00 and E2.00 for X_1 and X_2 respectively. **(6 MARKS)**

(b) Suppose the production function is $Y = X_1X_2$ and you have E200 to spend on the two inputs. If the price of X_1 is E1.00 and the price of X_2 is E2.00, how can you combine the two inputs in the production of Y? **(6 MARKS)**

Question Three

(i) Suppose you are planning to produce a given amount of maize using the following four inputs: X1, X2, X3 and X4. Explain how you will combine the four inputs in order to produce the give output of maize at minimum cost

(6 MARKS)

(ii) Explain how you can maximize profit from maize production using the four inputs mentioned in (i) above. **(10 MARKS)**

(iii) Now suppose you are producing maize and sugarcane using the inputs given in (i) above. How will you combine the four inputs in the production of the two crops? **(4 MARKS)**

(iv) Suppose that you can produce different combinations of two products A and B using a given amount of variable input. Explain with reasons the criteria you will use to allocate the input in the production of A and B. **(5 MARKS)**

Question Four

(a) Discuss with examples the different types of production possibility curves that illustrate the relationships among farm enterprises. **(12 MARKS)**

(b) Assume you are growing goods K and L partly for use in the manufacture of good Z and suppose the amount of goods K and L produced is not the same as the amount of good K and good L needed to optimize the production of good Z. With help of a diagram describe your situation and state what objective you would be trying to achieve. **(13 MARKS)**