UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: B.Sc. in Agriculture IV (AEM OPTION)

B.Sc. in Home Economics IV (FST OPTION)

COURSE CODE: AEM 405

TITLE OF PAPER: PRODUCTION ECONOMICS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION: 1.   **ANSWER QUESTION ONE AND CHOOSE ANY OTHER TWO FROM THE REMAINING THREE QUESTIONS.**

2.   **QUESTION ONE CARRIES FORTY (40) MARKS AND THE REMAINING QUESTIONS THIRTY MARKS EACH.**

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Question 1

(a)   What do you understand by economic efficiency with respect to production? Explain what conditions must be met for economic efficiency to occur.   **8 MARKS**

(b)   With the aid of diagrams explain the relationships among products.
10 MARKS

(c)   Suppose you observe the following production of maize on a fixed piece of land measuring 10 hectares. Labour is the only variable factor and each unit of the variable factor is equally efficient.

Labour (X)	Total output (Y)(tones)
1	8
2	24
3	54
4	80
5	95
6	108
7	108
8	96

(i) What economic recommendations would you provide to a new farmer who wants to purchase this piece of land for growing maize.   **7 MARKS**

(ii) If the price of labour is E26,000 and the price of maize is E1000 per tonne, how many labourers should be employed in order to maximize profits. Explain clearly the criterion you applied.   **15 MARKS**

Question 2

(a)   Suppose that 200 units of a given product can be produced by two inputs. If the prices of the two inputs 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 aid of a well labeled diagram.   **8 MARKS**

(b)   Briefly explain the relationship between the expansion path and profit maximization.   **10 MARKS**

(c)   Suppose a given product is produced by two inputs X_1 and X_2. The production function is $Y = 18 X_1 - X_1^2 + 14 X_2 - X_2^2$. 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 the working;

(i) Find the combination of the two inputs that will maximize profit.
(ii) Find the equation of the expansion path with X_1 on the left hand-side.
(iii) Show that the value of Y at which profit is maximum lies on the expansion path.

12 MARKS

Question 3

(a) Consider two production functions for Maize (M) and Beans (B), each employing Labor (L) as the variable input.

$$M = 10 + 2L - 0.1L^2$$

$$B = 5 + 4L - 0.2L^2$$

If the price of maize is E2.00 per kg and the price of beans is E1.00 per kg, how would you allocate 10 laborers among the maize and beans enterprises? **15 MARKS**

(b) Suppose you have E1000.00 to spend on two variable inputs, namely, G1 and G2 used in the production of output Y. If the price of G1 is E2.00 and the price of G2 is E1.00, what combination of the two inputs will you employ in order to maximize the output of Y assuming that the production function is given by $Y = G1 \times G2$
15 MARKS

(PLEASE SHOW ALL WORKING CLEARLY)

Question 4

Suppose Tomato and Green Pepper compete for resources in their production and in turn both of them are used as inputs in producing dish M.

(a) Draw a well labeled production possibility curve for Tomatoes and Green Pepper **5 MARKS**

(b) Draw a well labeled diagram to represent isoquants for dish M using Tomato and Green Pepper as inputs. **5 MARKS**

(c) Draw a well labeled diagram to show that the entire outputs of Tomato and Green Pepper are used to produce the maximum output of dish M. **6 MARKS**

(d)   Show a situation where Tomato and Green Pepper are traded on the market such that for the production of dish M, one input is produced in excess and this excess is exchanged in the market for additional units of the other input.   **10 MARKS**

(e)   What should the producer do if the least combination in (d) does not produce the maximum profit?   **4 MARKS**