



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2022/2023 ACADEMIC YEAR SECOND YEAR FIRST SEMESTER

SCHOOL OF BUSINESS AND ECONOMICS BSC. ECONOMICS, FINANCIAL ECONOMICS & ECONOMICS & STATISTICS

COURSE CODE: ECO 2104-1

COURSE TITLE: PRODUCTION ECONOMICS

DATE: 7TH DECEMBER 2022

TIME: 1100-1300

INSTRUCTIONS TO CANDIDATES

1. Answer Question one and any **two** questions Time **2 hours**.

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

QUESTION ONE (20 MARKS)

- a) Discuss the following aspects as regards production economics
- i. Rate of product transformation (1 mark)
 - ii. Elasticity of production (1 Mark)
 - iii. The Law of diminishing Returns (1 mark)
 - iv. Inverse production function (use a diagram) (2 Marks)
- b) Suppose that the production function is given by

$$y = 2x^{0.5}$$

If the price of x is \$3 and the price of y is \$5. Derive the corresponding *VMP* and *AVP* functions. What is *MFC*? Solve for the profit maximizing level for input use x. (5 Marks)

- c) Illustrate mathematically the general conditions for profit maximization demonstrating the necessary and sufficient conditions for profit maximization. (5 marks)
- d) Explain the key sources of economies of scale (5 marks)

QUESTION TWO (15 MARKS)

- a) Explain in detail the three stages of production in the neoclassical production function (6 marks)
- b) Given a production function: $y = x_1^2 + x_2^2 + x_1x_2$, is the production function homogenous? Explain (5 marks)
- c) Explain the characteristics of the Cobb Douglas type of function (4 marks)

QUESTION THREE (15 MARKS)

- a) Discuss what Euler's Theorem states and its significance in production economics (4 marks)
- b) Does the function $y = x_1 + 0.1x_1^2 - 0.05x_1^3 + x_2 + 0.1x_2^2 - 0.05x_2^3$ ever achieve a maximum? If so at what level of input use is output maximised? (6 marks)

- c) Suppose that an enterprise with a greater expected income also resulted in a greater input variability than that for another enterprise. How could this situation be considered within a marginal analysis framework? **(5 marks)**

QUESTION FOUR (15 MARKS)

- a) Consider the production function of an Eldoret maize farmer using DAP fertilizer (X_1) and CAN Top dressing fertilizer (X_2) as variable inputs: $Y = 25X_1^2 + 45X_1 + 2.7X_2^2 + 9.6X_2 - 0.8X_1X_2$.
- i. Find the optimum level of wheat output (Y) **(5 marks)**
 - ii. The levels of X_1 and X_2 required to produce the maximum level of Y. **(4 marks)**

- b) Suppose that the product transformation function is given by

$x = 2y_1^2 + 3y_2^3$ The price of y_1 is \$5 and the price of y_2 is \$4. Twelve units of x are available. How much x should be applied to y_1 and y_2 ? **(6 Marks)**

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