



**PAMIBIA UNIVERSITY**  
**OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES**  
**DEPARTMENT OF AGRICULTURAL SCIENCES AND AGRIBUSINESS**

<b>QUALIFICATION: BACHELOR OF SCIENCE IN AGRICULTURE</b>	
<b>QUALIFICATION CODE: 07BAGA</b>	<b>LEVEL: 7</b>
<b>COURSE CODE: PPE611S</b>	<b>COURSE NAME: PRINCIPLES OF PRODUCTION ECONOMICS</b>
<b>SESSION: JULY 2024</b>	<b>PAPER: 2</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS: 100</b>

<b>SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER(S)</b>	DR DAVID UCHEZUBA
<b>MODERATOR:</b>	DR THINAH MOYO

<p style="text-align: center;"><b>INSTRUCTIONS</b></p> <ol style="list-style-type: none"><li>1. This paper consists of three sections: Section A has 15 multiple-choice questions and 5 True or False questions. Section B is made up of four essay-type questions.</li><li>2. Answer ALL questions in blue or black ink.</li><li>3. Start each question on a new page in your answer booklet.</li><li>4. Questions relating to this paper may be raised in the initial 30 minutes after the start of the examination. Thereafter, students must use their initiative to deal with any perceived error or ambiguities &amp; any assumption made should be clearly stated.</li></ol>
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**THIS QUESTION PAPER CONSISTS OF 9 PAGES** (Including this front page)

## SECTION A: MULTIPLE CHOICE QUESTIONS

### Question 1

Which of the following statements is **correct**?

- A). The average physical product is above the marginal physical product in stage I
- B). The marginal physical product is equal to the average physical product in stage I.
- C). At the inflexion point, the TPP function changes from increasing at a decreasing rate to increasing at a constant rate.
- D). At the inflexion point, the TPP function changes from increasing at an increasing rate to increasing at a decreasing rate.

### Question 2

The function  $\log y = \log A + b_1 \log x_1 + b_2 \log x_2 + b_3 x_1 + b_4 x_2$  is an example of a

- A). Cobb-Douglas function
- B). Transcendental function
- C). Quadratic function
- D). Translog function

### Question 3

Which of the following statements is **incorrect** about stage II of the neoclassical production function?

- A). The slope becomes flatter with each additional unit of the variable input.
- B). The MPP curve intersects the horizontal quantity axis at the end of Stage II.
- C). APP is positive and the APP has a positive slope.
- D). The APP curve is at its maximum at the beginning of Stage II.

### Question 4

Which of the following statements is **incorrect** about the stage III of the neoclassical production function?

- A). The TPP has not reached its peak and is heading down.
- B). MPP is negative and the MPP curve has a negative slope.
- C). The MPP curve intersects the horizontal axis and is moving down.
- D). APP remains positive but the APP curve has a negative slope.

#### Question 5

Which stage of the neoclassical production function is referred to as the economic region of production

- A). Stage I
- B). Stage III
- C). Stages I & II
- D). Stage II

#### Question 6

Which of the following statements is **incorrect** about the elasticity of production?

- A). If  $E_P > 1$ : output responds strongly to a unit increase in input, use.
- B). If  $E_P = 1$ : output responds proportionately to a unit change in input.
- C). If  $0 < E_P < 1$ : output responds more than proportionately to a unit change in input.
- D). If  $E_P < 0$ : Output declines as the level of input increases

#### Question 7

What is the meaning of the term technical efficiency?

- A). A measure of the ability of the firm to maximize profit
- B). A measure of the ability of the firm to produce a certain level of output with maximum inputs.
- C). A measure of the ability of the firm to retain its competitive advantage.
- D). A measure of the ability of the firm to produce a certain level of output with minimal inputs.

#### Question 8

A firm has a technical efficiency of 93% and an allocative efficiency of 85.7%. What is the

production efficiency of this firm?

- A). 93.1%
- B). 79.7 %
- C). 97.7%
- D). 7.3%

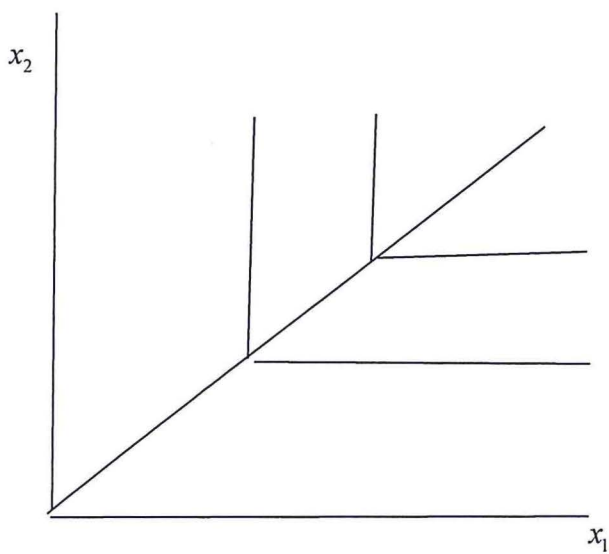
**Question 9**

Suppose a production function is given as  $y = 12x - 2x^2$  what is the input level that maximizes output.

- A). 8
- B). 2
- C). 4
- D). 3

**Question 10**

The type of substitution represented by the Isoquant shown below is an example of



- A). No factor substitution
- B). Perfect factor substitution
- C). Imperfect factor substitution
- D). Complementary Substitution

**Question 11**

Alternatively, the process of organizing production activities to determine how the various levels of inputs (factors, resources etc.) and outputs are combined while leaving other factors constant. The phrase *leaving other factors constant* implies.

- A). *Ceteris paribus*.
- B). Return to scale.
- C). Partial elasticity of substitution
- D). Homogeneity to degree zero

**Question 12**

Which of the following is **not** a factor of production?

- A). Manager's family labour
- B). Manager's herd of cattle
- C). Manager's skill
- D). Manager's produce

**Question 13**

At maximum, the slope of a total physical product is zero. This implies.

- A). Diseconomies of scale
- B). The average physical product is zero.
- C). Marginal physical product is zero.
- D). Elasticity of production is greater than one.

**Question 14**

When all inputs are increased proportionally If output more than doubles.

- A). Economies of scale exist.
- B). Diseconomies of scale exist.
- C). Both economies and diseconomies of scale exist.
- D). Neither economies nor diseconomies of scale exist.

**Question 15**

A function linking output to input is called.

- A). Production function
- B). Demand function.
- C). Aesthetic function
- D). Anaesthetic function

**TRUE OR FALSE QUESTIONS****Indicate whether the question is True or False**

Question 16 In short-run production all inputs are fixed. True or False?

Question 17 Production is monoprotic if one out is produced per period. True or False?

Question 18 The highest profit will be achieved when the difference between TR and TC is maximised. True or False?

Question 19. All production functions are homogeneous. True or False?

Question 20. If the elasticity of production is large this means the marginal physical product is large relative to the average physical product. True or False?

## SECTION B: ESSAY-TYPE QUESTIONS

### Question 1

1.1. Assume a corn production function is given by the following functions.

$$y = 4 + 24x - 4x^2$$

- 1.1.1. Find the input level that maximizes output. (2 marks)
- 1.1.2. What is the maximum output (corn yield) at the calculated level of input? (2 marks)
- 1.2.3. Find the input level that maximizes the average physical product (3 Marks)

1.2. Consider the following production function.

$$y = 10x_1 - 10x_2 + x_1^2 + x_2^2$$

- 1.2.1. Find the input levels that satisfy the necessary and sufficient conditions for maximum or minimum output. (10 marks)
- 1.2.2. Confirm that output is a maximum or a minimum. (3 marks)

### Question 2

(20 Marks)

2.1. Define the following concepts.

- 2.1.1. Production efficiency (2 Mark)
- 2.1.2. Technical efficiency (2 Mark)
- 2.1.3. Allocative efficiency (2 Mark)
- 2.1.4. Economics efficiency (2 Mark)

2.2. The total cost of producing an item is N\$250. The cost of capital per unit of production is N\$24 and Labour cost per unit is N\$50.

- 2.2.1. Determine the Iso-cost equation. (2 Marks)
- 2.2.2. Draw the Isocost line. (2 Marks)
- 2.2.3. What is the unit of labour used when capital per unit was 3? (2 Marks)

2.3. List the features of an Isoquant. (3 Marks)

2.4. Give reasons why the Isoquant line cannot cross (3 Marks)

**Question 3****(20 Marks)**

3.1. Consider the production function.

$$y = x + 4x^2 - 0.2x^3$$

3.1.1 Derive the marginal physical production function. (2 Marks)

3.1.2. Derive the average physical product function. (2 Marks)

3.1.3. Find the value of the marginal physical product at 2 units of input. (2 Marks)

3.1.4. Find the value of the average physical product at 2 units of input. (2 Marks)

3.1.5. Find the input level that maximizes the marginal physical product. (2 Marks)

3.1.6. Find the input level that maximizes the average physical product. (2 Marks)

2.1.7. Find the output level at 2 units of input. (2 Marks)

3.1.8. Find the input level that maximizes total output. (6 Marks)

**Question 4****(20 Marks)**

4.1 (10 Marks)

The table below shows the relationship between Total Physical Product (TPP), Average Physical Product (APP), Marginal Physical Product (MPP) and Marginal Value Product (MVP). If the price of output is N\$1 per unit of input, complete the table.

Input	TPP	APP	MPP	TVP	AVP	MVP
0	0					
10	75					
20	245					
30	435					
40	560					
50	648					



4.2.

(10 Marks)

A firm has the following cost function.

$$TC = 30 + 18Q - 2.7Q^2 + 0.15Q^3$$

Calculate the Total Cost (TC), Total Variable Cost (TVC), Average Total Cost (ATC), Average Variable Cost (AVC) and Marginal Cost (MC) if this firm is producing quantities of output that vary from zero to 5 units. Tabulate your values.

**END**