NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCE SCIENCES

QUALIFICATION : BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATION CODE: 07BAGA	**LEVEL:** 7
COURSE CODE: PPE611S	**COURSE NAME:** PRINCIPLES OF PRODUCTION ECONOMICS
SESSION: JULY 2022	**SESSION:** JULY
DURATION: 3 HOURS	**MARKS:** 100

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
1. This paper consists of two sections: Section 1 has five (5) multiple choice questions, section 2 is made up of five essay type questions.
2. Answer ALL questions and in blue or black ink.
3. Start each question on a new page in your answer booklet.
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 own initiative to deal with any perceived error or ambiguities & any assumption made should be clearly stated.

THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this front page)

Question 1

Find the level of corn yield with 4 units of Capital and 3 units of labour using the following production function, $y = AK^{0.165} L^{0.81}$, where K is the capital in N$, L is the labour measured in man hour and A is a constant parameter given as 100 units.

a. 306.05

b. 306.00

c. 306.60

d. 306.06

e. 306.66

Question 2

The total cost of producing an item is N$200. The cost of capital per unit of production is N$25 and Labour cost per unit is N$25. What is the unit of labour used when capital per unit was 3?

a. 5

b. 50

c. 75

d. 15

e. 25

Question 3

An Isocline is

a. a line connecting points on an Iso-cost that have zero marginal rate of technical substitution

b. a line connecting points on an Isoquant that have the same marginal rate of technical substitution.

c. a line connecting points on an Iso-cost that have the same marginal rate of technical substitution.

d. line connecting points on an Isoquant that have the different marginal rate of technical substitution.

e. a line connecting points on an Isoquant that have the same return to scale.

Question 4

A ridgeline is an Isocline connecting points of

a. Positive slope on the Isoquant

b. Zero slopes on the Isoquant

c. Negative slope on the Isoquant

d. Negative slope on the expansion path

e. Positive slope on the expansion path

Question 5

To minimize profit, we equate the ratio of marginal productivities to the ratio of marginal factor cost for the level of output. This principle is known as the

a. Profit minimization rule

b. Expansion path rule

c. Iso-cost rule

d. Iso-quant rule

e. Equi-marginal principle

Question 1

1.1.   Draw a neoclassical production map showing total, average and marginal productivities. (5 Marks)

1.2.   Using the map in question 1.1 above, explain the relationship between, the Total Phyisical Product (TPP), Average Physical product (APP) and Marginal Physical Product. (6 Marks)

1.3.   Explain the term "Economic region of production" (1 Marks)

1.4.   Explain why neoclassical production surface is a sigmoid curve and not an infinite increasing productivity function (2 Marks)

1.5. Give reasons to explain why we undertake the following assumptions in production economics

1.5.1. Output homogeneity (2 Marks)

1.5.2. Mono-periodic production (2 Marks)

1.5.3. Profit maximization (2 Marks)

Question 2

2.1. Define the following

2.1.1. Partial elasticity of production (1 Mark)

2.1.2. Function coefficient of production (1 Mark)

2.2. Consider the production function

$$y = 5x + 2x^2 - 2x^3$$

2.2.1   Find the elasticity of production when the output level is 4 units. (8 Marks)

2.2.2.   Find the elasticity of production at input level 6 for the given function

$$y = x^2 - \frac{1}{3}x^3$$ (8 Marks)

2.2.3.   What can you say about the elasticity of production for the production function in questions 2.2.1 and 2.2.2 above? (2 Marks)

Question 3

3.1. For the two-input production function

$$y = 4x_1^{0.6} x_2^{0.2}$$

Find the function coefficient at input level of two units   (12 Marks)

3.2. Find the degree of homogeneity and return to scale for the following production functions.

a). $Q = 10xy - 2x^2 - y^2$ (2 Marks)

b). $y = 0.6x + 0.2y$ (2 Marks)

c). $Q = \alpha L^\beta K^{1-\beta}$ (2 Marks)

d). $Q = 2x_1^2 + 6x_1 x_2 + 21x_2^2$ (2 Marks)

Question 4

Suppose the Potato output sells for N$5 per unit and the input sells for N$4 per unit.

4.1. Fill in the blank spaces in the Table 4 below.

4.2. What is the profit maximizing level of input use?

Table 4 Profit maximizing level of input

Input	Output	VMP	AVP
0	0	—	—
10	50	—	—
25	75	—	—
40	80	—	—
50	85	—	—

(20 Marks)

Question 5

5.1. Define the following concepts

a) Isoquant   (1 Mark)

b) Iso-cost   (1 Mark)

c) Marginal rate of technical substitution   (1 Mark)

5.2. Give reasons to explain why

a). Isoquants are convex to the origin   (1 Mark)

b) Isoquant curves cannot meet   (1 Mark)

5.3.

a). Find the necessary and sufficient conditions for the maximization of the following production functions

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

(5 Marks)

b) Check that this condition is fulfilled at the computed input levels   (5 Marks)