



ETA 121-2 Principles of Agricultural Economics

Instructions to candidates

Duration: One (01) hour

Number of questions: Two (02) Structured Questions

Number of Pages: Nine (09)

Mark allocation: 60%

Answer all questions in the given space

01.

a. Define the followings;

i. Demand (5 marks)

.....
.....
.....
.....

ii. Supply (5 marks)

.....
.....
.....
.....

iii. Price elasticity (5 marks)

.....
.....
.....
.....

iv. Income elasticity (5 marks)

.....
.....
.....
.....

v. Consumer surplus (5 marks)

.....
.....
.....
.....

vi. Producer surplus (5 marks)

.....
.....
.....
.....

b. Suppose the demand is given by the equation $Q_d = 80 - 20P$, where Q_d is the quantity demanded and P is the price of the good. Supply is described by the equation $Q_s = 40 + 20P$, where Q_s is the quantity supplied.

i. Sketch the demand and the supply functions. (20 marks)

ii. Find the equilibrium quantity and price. (10 marks)

iii. Calculate the producer and consumer surpluses at the equilibrium price. (10 marks)

iv. Calculate the total welfare to the society. (10 marks)

v. If the price of the good is \$3, calculate the quantity supplied and demanded. (10 marks)

vi. How do you explain the above (v) situation? (5 marks)

.....
.....
.....
.....

vii. What can be done in a situation like above? (5 marks)

.....
.....
.....
.....

02.

a. Define the following terms;

i. Total Physical Product (TPP) (6 Marks)

.....
.....
.....
.....

ii. Average Physical Product (APP) (6 Marks)

.....
.....
.....
.....

iii. Marginal Physical Product (MPP) (6 Marks)

.....
.....

- ii. How you find out the profit maximizing fertilizer level if the price of fertilizer, the price of output, and the total costs are given. (10 Marks)

- c. The given below is a production function where **Y** is the rice output in kilograms and **X** is the amount of fertilizer (kilograms) used;

$$Y = X^2 - \frac{1}{30}X^3$$

Find the following;

- i. APP function (3 Marks)

.....

- ii. Input level which corresponds to maximum APP (3 Marks)

.....

- iii. MPP function (3 Marks)

.....

- iv. Input level which corresponds to maximum MPP (4 Marks)

.....

- v. Input level which corresponds to maximum output (4 Marks)

.....

vi. Elasticity of Production when $X = 10$ (4 Marks)

.....
.....
.....
.....

d.

i. What is meant by an isoquant? (4 Marks)

.....
.....
.....
.....

ii. How do you define the Marginal Rate of Technical Substitute? Use a suitable illustration. (10 Marks)

- iii. The following combinations of x_1 and x_2 all produce 100 bushels of corn. Calculate the $MRTS_{x_1x_2}$ and the $MRTS_{x_2x_1}$ at each midpoint (10 Marks)

Combination	Units of x_1	Units of x_2	$MRTS_{x_1x_2}$	$MRTS_{x_2x_1}$
A	10	1		
B	5	2		
C	3	3		
D	2	4		
E	1.5	5		

- iv. For the production function $y = 3x_1 + 2x_2$, find;

The MPP of x_1 (3 Marks)

.....

.....

.....

.....

The MPP of x_2 (3 Marks)

.....

.....

.....

.....

The MRTS of x_1 for x_2 (3 Marks)

.....

.....

.....

.....