# UNIVERSITY OF KABIANGA

## UNIVERSITY EXAMINATIONS
## 2015/2016 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER EXAMINATION

## FOR THE DEGREE OF
## BACHELOR OF ARTS (ECONOMICS)

**COURSE CODE:** **ECO 210**

**COURSE TITLE:** **BASIC MATHEMATICS**

**DATE: 8TH DECEMBER, 2015** **TIME: 2.00 P.M - 5.00 P.M.**

**INSTRUCTIONS TO CANDIDATES**

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UNIVERSITY OF KABIANGA

ECO 210: BASIC MATHEMATICS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER THREE QUESTIONS

## QUESTION ONE

a) Explain the role paid by basic mathematics in the training of economic analysts. (10 marks)

b) Set R is defined as

$R = \{a, b, c\}$

Required:

Generate possible subsets from set R (5 marks)

c) Using a venn diagram, explain the following terms associated with set theory:

i). Intersection of sets
ii). Union of sets
iii). Complement of a set
iv). Mutually exclusive sets (10 marks)

## QUESTION TWO

a) Using graphical illustrations, explain forms of linear functions that meet important applications in economic analysis (4 marks)

b) i) State the basic assumptions of Break-even analysis (5 marks)

ii) Consider a product with the following data:

P = Sh. 200
V = Sh. 160
FC = Sh. 800,000

**Required:**

The profit if sales are 10,000 units (6 marks)

## QUESTION THREE

a) State the key applications of linear functions (4 marks)

b) For a business firm, show that profit made is a linear function of activity level (6 marks)

c) Graphically, illustrate the Break-even concept (5 marks)

## QUESTION FOUR

a) Explain how Calculus helps in business management (6 marks)

b) A firm has analysed their operating conditions, prices and costs and have developed the following functions:

Revenue, $R = 400Q - 4Q^2$

Cost, $C = Q^2 + 10Q + 30$

Where Q = units sold

The firm wishes to maximize profit

**Required:**

a) Develop the profit function (3 marks)

b) What quantity should be sold? (3 marks)

c) At what price? (3 marks)

## QUESTION FIVE

a) Find the equilibrium price and quantity for the following single commodity market model:

$Qd = 30 - 6p$

$Qs = -15 + 9p$ (6 marks)

b) Assume that a marginal profit function is $Y = 100 - 2x$

Where; Y is in shillings

X is sales in units

You have also found out that the company breaks even on sales of 5 units.

**Required:**

Determine the fixed costs of the company (9 marks)