



GARISSA UNIVERSITY

**UNIVERSITY EXAMINATION 2017/2018 ACADEMIC YEAR TWO
FIRST SEMESTER EXAMINATION**

SCHOOL OF BUSINESS AND ECONOMICS

FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT

COURSE CODE: ECO 210

COURSE TITLE: INTERMEDIATE MICROECONOMICS

EXAMINATION DURATION: 3 HOURS

DATE: 05/12/17

TIME: 09.00-12.00 PM

INSTRUCTION TO CANDIDATES

- The examination has SIX (6) questions
- Question ONE (1) is COMPULSORY
- Choose any other THREE (3) questions from the remaining FIVE (5) questions
- Use sketch diagrams to illustrate your answer whenever necessary
- Do not carry mobile phones or any other written materials in examination room
- Do not write on this paper

This paper consists of FOUR (4) printed pages

please turn over



QUESTION ONE (COMPULSORY)

(a) Evaluate the following:

i. $\sum_{k=1}^4 (2k + 3)^2$ [2 marks]

ii. $\sum_{i=1}^3 5x^i$ [2 marks]

(b) Define the following terms

i. A finite set [1 mark]

ii. A null set [1 mark]

iii. An exponential function [1 mark]

(c) Given $A = \{a, b, c\}$ find the power set of A [1 mark]

(d) Solve the inequality $[2 + 2x] < 10$ [3 marks]

(e) Solve the linear simultaneous equations: [3 marks]

$$3x + 4y = 4$$

$$x - 4y = 16$$

(f) Find the equilibrium price \bar{P} and equilibrium quantity \bar{Q} for the market models [5 marks]

$$Q_d = 26 - 2p$$

$$Q_s = -10 + 7p$$

(g) Sketch the function $y = 9 - x^2$ [3 marks]

(h) Solve for x in the equation $5 \ln x - 4 = 2$ [3 marks]

QUESTION TWO

(a) In a recent survey of 400 students at NEP polytechnic, 100 students were listed as studying typing (T) and 150 were listed as studying accounting (A). 75 students were registered for both courses.

i. Illustrate this information in a Venn diagram [2 marks]

ii. Find the number of students in the college who are not registered for either course [1 mark]

iii. How many students were registered for typing only [1 mark]

(b) Chapati Mix Ltd conducted a market survey to investigate customers' loyalty to the company's three brands of flour namely Ngano (N), Chapo (C) and Super (S). The survey covered a total of 140 households. The following results were obtained

- 53 households were loyal to Ngano
- 52 households were loyal to Chapo
- 54 households were loyal to Super



- 15 households were loyal to both Ngano and Chapo
- 10 households were loyal to both Ngano and Super
- 12 households were loyal to both Chapo and Super
- 13 households were **not** loyal to any of the three brands

Determine the following:

- The number of households that were loyal to all the three brands
- The number of households that were loyal to exactly two brands
- The number of households that were loyal to the Ngano brand only
- The number of households that were loyal to at most one brand
- The number of households that were loyal to Ngano or Chapo but not loyal to Super

[11 marks]

QUESTION THREE

- State the three components of the single commodity market model and interpret the gradients of two of them [7 marks]
- Find the equilibrium, income consumption and tax given the national income model [8 marks]

$$\bar{Y} = \bar{C} + \bar{I} + \bar{G}$$

$$\bar{C} = 100 + 0.8d$$

$$\bar{T} = 10 + 0.1\bar{Y}$$

$$\bar{I} = 50$$

$$\bar{G} = 30$$

$$d = \bar{Y} - \bar{T}$$

QUESTION FOUR

- The growing value of Gross National Product (GNP) is given by
 $GNP_t = GNP_0 e^{rt}$, $r = 1.5\%$
 - If $GNP_0 = 500$, find the value of GNP 10 years from now [2 marks]
 - If $GNP_0 = 1000$, after how many years will the GNP double [8 marks]
- Solve for x in the equation $2e^{2x-100} = 300$. [5 marks]



QUESTION FIVE

The growth of population and labour force are represented by the functions

$$P_t = P_0 e^{rt} \quad r = 2.0\%$$

$$L_t = L_0 e^{rt} \quad r = 1.8\%$$

- (a) Find the population size seven years from today given that $P_0 = 20$ million. **[4 marks]**
- (b) Find the period of time over which the population will be doubled.
- (c) Find the labour force three years from today given that $P_0 = 5$ million **[4 marks]**

QUESTION SIX

- (a) Find the change in y for the function $y = 300 - 400x + 600x^2$ given that x has changed from 0.1 to 0.12 **[4 marks]**
- (b) Find the total differentials for the functions
- i. (i) $Z = 4x^2 + 5xy - 3y^2$ **[2 marks]**
 - ii. (ii) $Z = \frac{x^2}{y^2}$ **[3 marks]**
 - iii. (iii) $Z = \frac{x+y}{y^2}$ **[3 marks]**
 - iv. (iv) $Z = 3x^2 + xy^3$ **[3 marks]**

