



# MURANG'A UNIVERSITY OF TECHNOLOGY

## SCHOOL OF BUSINESS AND ECONOMICS

### DEPARTMENT OF COMMERCE

#### UNIVERSITY ORDINARY EXAMINATION

#### FIRST YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF COMMERCE AND BACHELOR OF HUMAN RESOURCE MANAGEMENT

AMM101 – BASIC MATHEMATICS

DURATION: 2 HOURS

DATE: 23<sup>RD</sup> APRIL, 2018

TIME: 2.00- 4.00 P.M.

#### **Instructions to Candidates:**

1. Answer **Question 1** and **Any Other Two** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

## SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

### QUESTION ONE

- a) Explain the following terms a used in set theory.
- Universal Set. (2 marks)
  - Subset. (2 marks)
- b) Solve the simultaneous Linear equations.
- $$5x + 6y = 24,400$$
- $$7x + 9y = 35,600$$
- (5 marks)
- c) Find the  $n^{\text{th}}$  term and hence  $11^{\text{th}}$  term of the Arithmetic progression 3,5,7,9 ... (4 marks)
- d) If  $A = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{pmatrix}$ ,  $B = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$  and  $AB = \begin{pmatrix} 6 \\ 3 \\ 1 \end{pmatrix}$  Find the values of x,y,z (6 marks)
- e) Solve the equation  $\log_2(x+7) = 2 - \log_2(x+4)$  (6 marks)
- f) Find the turning points on the curve  $y = x^3 - 3x^2 + 4$  (5 marks)

## SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

### QUESTION TWO

- a) Mention five types of matrices. (4 marks)
- b) A man gets employment of \$ 750 per month with an annual increment of \$50. What does he earn in 10th year? (4 marks)
- c) A quick survey of 1000 children in a refugee comp produced the following results
- 320 children were fed on beans
  - 200 Children were fed on rice.
  - 450 children were fed on potatoes.
  - 150 children were fed on beans and potatoes.
  - 70 children were fed on beans and rice.
  - 100 children were fed on rice and potatoes.
  - 300 children were fed on none of three types of food.
- i. Present the above information in the form of a Venn diagram (5 marks)
- Find:

- ii. The number of children who were fed on all the three types of food. (2 marks)
- iii. The number of children who were fed on exactly one of three types of foods. (2marks)
- iv. The number of children who were fed on at least two types of food. (2 marks)

**QUESTION THREE**

a)  $A = \begin{bmatrix} 12 & -3 \\ -7 & 2 \end{bmatrix}$   $B = \begin{bmatrix} 4 & 7 \\ 5 & 0 \\ 1 & 4 \end{bmatrix}$

Work out:

- i.  $A^2$
- ii.  $A^{-1}$
- iii.  $A \cdot B^T$
- iv.  $BA$  (16 marks)

b) Solve by elimination

$$12x - 3y = 6$$

$$-7x + 3y = -1$$

(4 marks)

**QUESTION FOUR**

a) Solve for x

i.  $1 + \text{Log}_5 x = \text{Log}_5 12$

ii.  $\text{Log}(3x + 4) - \text{Log}(3 - x) = 1$

iii.  $\frac{x-1}{2} + \frac{x+3}{4} = \frac{1}{x-1}$

(20 marks)