



# **GRE TSA UNIVERSITY - THIKA**

## **UNIVERSITY EXAMINATIONS JANUARY - APRIL 2021 SEMESTER**

### **CERTIFICATE IN INFORMATION TECHNOLOGY**

**COURSE CODE: CFIT 014**

**COURSE TITLE: BASIC MATHEMATICS**

**DATE: 10 MAY 2021**

**TIME: 11.30 AM - 1.30 PM**

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#### **INSTRUCTIONS TO CANDIDATES**

1. SECTION A IS **COMPULSORY**.
2. SECTION B: ANSWER ANY OTHER **THREE** QUESTIONS.
3. **DO NOT** WRITE ANYTHING ON THIS QUESTION PAPER AS IT WILL BE AN EXAM IRREGULARITY.
4. ALL ROUGH WORK SHOULD BE AT THE BACK OF YOUR ANSWER BOOKLET AND CROSSED OUT.

**CAUTION:** *All exam rooms are under CCTV surveillance during the examination period.*

## SECTION A: COMPULSORY

### QUESTION ONE

a) Solve the following pairs of simultaneous equations

i.  $2x - 3y = -7$  [4 Marks]

$$3x + y = -5$$

ii.  $3x + 2y = 16$  [4 Marks]

$$2x - y = 6$$

b) Given the following matrices

$$A = \begin{pmatrix} 3 & -2 \\ -7 & 5 \end{pmatrix} \text{ and } B = \begin{pmatrix} -2 & 1 \\ 4 & -2 \end{pmatrix} \text{ Find}$$

i.  $\text{Det } A$  [3 Marks]

ii.  $A + B$  [3 Marks]

iii.  $AB$  [4 Marks]

iv.  $B^{-1}$  [4 Marks]

c) Simplify  $\frac{35a^7b^{12}c^3}{5a^5b^4c^2}$  [5 Marks]

d) Given the sequence 1, 2, 4, 8 ... ..

Find

i. The common ratio [2 Marks]

ii. The 10<sup>th</sup> term [3 Marks]

iii. The sum of the first 12 terms [4 Marks]

e) Factorize  $x^2 + 3x + 2 = 0$  [4 Marks]

## SECTION B: ANSWER ANY OTHER THREE QUESTIONS

### QUESTION TWO

a) The cost of three sheep and two goats is sh. 7200. If four sheep and a goat costs sh. 7600, find the cost of two goats and a sheep [5 Marks]

b) Solve the equation  $\frac{5x+2}{4} - \frac{3}{2} = \frac{7x-1}{3}$  [5 Marks]

c) Given the following set of numbers

$$\{1, -3, 0.8, \frac{1}{5}, -9, 0, \sqrt{3} - 4, 14, \pi\} \text{ Identify}$$

i. All Natural numbers [2 Marks]

ii. All Integers [3 Marks]

iii. All Rational numbers [2 Marks]

iv. All irrational numbers [3 Marks]

### QUESTION THREE

- a) Simplify  $\frac{3x+1}{2} = \frac{4x-3}{3} + 3$  [5 Marks]
- b) Find  $y$  if  $\log_2 y - 2 = \log_2 92$  [6 Marks]
- c) Using Completing the square method, solve,  $9x^2 + 27x + 20 = 0$  [5 Marks]
- d) Simplify  $8^n \times 2^{2n} \div 4^{3n}$  [4 Marks]

### QUESTION FOUR

- a) Using the following sequence,  $2 + 5 + 8 + \dots$  find
- i. The common difference [2 Marks]
  - ii. The 5<sup>th</sup> term [4 Marks]
  - iii. The sum of the first 20 terms [4 Marks]
- b) Factorize  $x^2 + 4x - 12 = 0$  [5 Marks]
- c) Solve the equation  $9^x \times 3^{2x-1} = 3^{15}$  [5 Marks]

### QUESTION FIVE

- a) Solve for  $x$  and  $y$  in  $2^{2x+y} = 8$  and  $3^{x-y} = 1$  [5 Marks]
- b) Solve for  $x$  given  $\frac{1}{2}\log(x+1) - 2$  [5 Marks]
- c) Using completing the square method, solve  $2x^2 + 3x - 7 = 0$  [5 Marks]
- d) Two years ago, a man was 7 times as old as his son. In 3 years time, he will be only 4 times as old as son. Find their respective ages. [5 Marks]