# GRETSA UNIVERSITY - THIKA

## UNIVERSITY EXAMINATIONS

## JANUARY - APRIL 2019 SEMESTER

## BRIDGING MATHEMATICS

**COURSE CODE: GUBC 011**

**COURSE TITLE: BRIDGING MATHEMATICS**

**DATE: 8 APRIL 2019**                    **TIME: 8.00AM -11.00AM**

**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 for $x$ in $9^{x+1} + 3^{2x+1} = 36$       [5 marks]

b) The sum of the first 8 terms of an A.P is 220. If the third term is 17, find

  i.      The common difference       [3 marks]
  ii.     Sixth term       [5 marks]
  iii.    Sum of the first 7 terms       [5 marks]

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

d) Solve for x given $\log_3 9 = x$ ⬚       [4 marks]

e) State any three laws of indices       [6 marks]

f) Explain the following types of numbers

  i.      Natural numbers       [2 marks]
  ii.     Integers       [2 marks]
  iii.    Rational numbers       [3 marks]

## SECTION B: ANSWER ANY THREE QUESTIONS

### Question Two

**a)** . Find $y$ if $\log_2 y - 2 = \log_2 92$       [5 marks]

**b)** Given the arithmetic sequence 4, 11, 18, …, find

  i.      The common difference       [3 marks]

  ii.     The $6^{th}$ term       [4 marks]

  iii.    Sum of the first 10 terms       [4 marks]

**c)**      Factorize $x^2 + 6x - 16 = 0$       [4 marks]

### Question Three

a) In an A.P the $13^{th}$ term is 27, and the $7^{th}$ term is three times the second term. Find

  i.      The first term,       [3 marks]

  ii.     The common difference       [4 marks]

  iii.    The sum of the first nine terms.       [5 marks]

b) Show that $\log_a(AB) = \log_a A + \log_a B$       [8 marks]

**Question Four**

a) Given $\begin{pmatrix} x+2y & 14 \\ -3 & y-2 \end{pmatrix} = \begin{pmatrix} 4 & 14 \\ -3 & 7+3x \end{pmatrix}$ find the values of x and y     **[4 marks]**

**b)** Given $A = \begin{pmatrix} 4 & 5 \\ 8 & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 4 & -3 \\ 6 & 2 \end{pmatrix}$    Find,

    **i.**       Determinant of A                                          **[2 marks]**

    **ii.**       A+B                                                  **[2 marks]**

    **iii.**      AB                                                    [4 marks]

c) Using completing the square method, evaluate $x^2 + 3x + 2 = 0$     [4 marks]

d) Solve the equation $\dfrac{5x+2}{4} - \dfrac{3}{2} = \dfrac{7x-1}{3}$                   **[4 marks]**


**Question Five**

(a) Given that the first term of an arithmetic sequence is a and the Common difference is
d, show that the sum of the first n terms is $S_n = \dfrac{n}{2}\left[2a+(n-1)d\right]$     [8 marks]

(b) Using matrix method, evaluate                             [4 marks]

    $6x + 4y = 24$

    $7x - 4y = 2$

(c) Simplify $\dfrac{3-7i}{4-5i}$ where i is an imaginary number              [4 marks]

(d) Solve for x given $x^2 - 8x + 13 = 0$                        [4 marks]