

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE CERTIFICATE OF BRIDGING MATHEMATICS

COURSE CODE: BMATH 002

COURSE TITLE: BASIC ALGEBRA

STREAM: BRIDGING MATHEMATICS

DAY: THURSDAY

TIME: 2.00 – 4.00 P.M.

DATE: 29/07/2010

INSTRUCTIONS:

- Answer question **ONE** questions and any other three

PLEASE TURN OVER

QUESTION ONE

I. Solve the following

a) $1 + \log_5 x = \log_5 12$

b) $\log_3 4 + \log_3 x + \log_3 6 - \log_3 5 = \log_3 2$

c) $\log(3x - 4) - \log(3 - x) = 1$ (10 marks)

II. Factorise each of the following

a) $2x^2 + 3x + 1$

b) $9x^2 + 12x + 4$

c) $1 - 8x + 16x^2$ (9 marks)

III. a) Derive the quadratic formula

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (5 \text{ marks})$$

b) Solve the following equation $x^2 + 4x + 4 = 0$ by

i) Completing square method

ii) Factorization (6 marks)

QUESTION TWO

I. a) Expand the following expressions in descending order of x;

i) $(X - Y)^7$

ii) $(X + 0.5)^4$

b) Use binomial expansion to solve

i) $(1.02)^6$ to 4 s.f

ii) Expand $(1 + x)^9$ upto the term x^3 and use the expansion to estimate $(0.98)^9$

QUESTION THREE

I. In the arithmetic series $1 + 4 + 7 + 10 + \dots$ find the sum of the first

a) 10 terms

b) 100 terms

II. Use matrix method to solve the following pair of simultaneous equations

$$3a + 2b = 12$$

$$4a - b = 5$$

III. Draw the graph of $y = 2x^2 - 4x + 1$ and estimate the roots from your graph.

QUESTION FOUR

a) Solve the following simultaneous equations graphically

$$y = x^2 - 2x + 1$$

$$y = 5 - 2x$$

b) A group of young men decided to raise sh. 480, 000 to start a business. Before actual payments was made four members pulled out and each of those remaining had to pay an additional sh. 20, 000. Determine the original number of members.

c) i) Solve for x in $2^x \times 4^{2x} = 16$

ii) $a^{3x} \div a^x$

QUESTION FIVE

I. Find the unknown in

$$\begin{bmatrix} X + 4 & Y + 6 \\ 12 & 3 + Z \end{bmatrix} = \begin{bmatrix} 11 & 8 \\ 12 & 7 \end{bmatrix}$$

$$\begin{bmatrix} x + y + z \\ y + z \\ 2z \end{bmatrix} = \begin{bmatrix} 6 \\ 5 \\ 6 \end{bmatrix}$$

II. Find the value of x if the matrix below is a singular matrix

$$\begin{bmatrix} 2x - 1 & 1 \\ X^2 & 1 \end{bmatrix}$$

III. Given that $A = \begin{bmatrix} 3 & -2 \\ 4 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 \\ 3 & 7 \end{bmatrix}$

Find i) AB^{-1}

ii) $\begin{bmatrix} A + B^{-1} \end{bmatrix}$