

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR

CERTIFICATE IN BRIDGING MATHEMATICS

COURSE CODE: BMATH 002

COURSE TITLE: BASIC ALGEBRA

STREAM: BRIDGING

DAY: TUESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 01/09/2009

INSTRUCTIONS:

Attempt **Question ONE** and **Any other TWO Questions**

PLEASE TURN OVER

QUESTION ONE (30 marks)

i. Solve the following

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

b) $\log_3 34 + \log_3 x + \log_3 6 - \log_3 5 = \log_3 2$

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

ii. Factorize each of the following

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

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

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

iii. a) Given the quadratic equation $ax^2 + bx + c = 0$, 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 (20 marks)

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 find the approximate value of

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 (20 marks)

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

a) 10 terms

b) If the 7th term in a series is 28 and the 5th term is 16, find the first term and the common difference.

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 (20 marks)

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 (20 marks)

i Find the unknown in

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

b)
$$\begin{pmatrix} x + y + z \\ y + z \\ 2z \end{pmatrix} = \begin{pmatrix} 6 \\ 5 \\ 6 \end{pmatrix}$$

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

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

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

Find i) AB^{-1}

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