KABARAK   **UNIVERSITY**

UNIVERSITY EXAMINATIONS
2008/2009 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF EDUCATION
SCIENCE

COURSE CODE: **MATH 100**

COURSE TITLE: **GENERAL MATHEMATIC**

STREAM: **SESSION I**

DAY: **THURSDAY**

TIME: **9.00 – 11.00 A.M.**

DATE: **13/08/2009**

INSTRUCTIONS:

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

PLEASE TURN OVER

Questions one (30 marks)

a) Find the value of $\left(\frac{27}{8}\right)^{-2/3}$ (3marks)

b) Express the following in logarithmic form:

  1) $2^4 = 16$ ii) $125 = 5^3$ (4marks)

c) Simplify $\dfrac{\log 81}{\log 9}$ (2mks)

d) Expand $(a + b)^6$ in descending powers of a   (3mks)

e) Solve the equation

       $3x - 10 = 22 - 5x$ (2mks)

f) Write the following factors in terms of its partial fractions:

  (i) $\dfrac{5 - x}{x^2 + 5x + 6}$ (ii) $\dfrac{7 - 2x}{x^2 - 2x + 1}$ (8mks)

g) A person wishes to place a bet which selects the first three horses to finish a race in their correct order of finish. If eight horses are in the race, how many different possibilities exist for the first three assuming no ties?   (3mks)

h) Find the number of combination of six persons take three at a time to form committee.

       (2mks)

i) Classify each of the following functions by type:
       i) $F(x) = -24$
       ii) $F(x) = x^2 - 25$
       iii) $F(x) = \dfrac{x^2}{\sqrt{x^3}}$

QUESTION TWO (20MKS)

a) Compute the variance and hence the standard deviation of the following set of data:
2, 3, 4, 5, 6, 8, 10, 10

       (5mks)

b) State the mode of the following set of data:
       i)   3, 6, 7, 3, 8, 4, 7, 9, 8, 7, 3, 6, 7
       ii)   2, 4, 2, 5, 3, 2, 5, 7, 5, 8, 8, 8, 2, 5

c) Determine the inverse of the following functions:
 i) $F(x) = \log_5 x$
 ii) $F(x) = 3x$

(3mks)

d) If $t = f(v) = 2v^2 - 5v$ determine
 i) $F(-5)$
 ii) $F(x - y)$

(5mks)

QUESTION THREE (20 MKS)

a) Solve the inequality $3x - 2 \leq 4x + 8$ and represent it solution on a number line

(5mks)

b) Solve the equations
 I) $|5 - 2x| = 9$
 II) $|10 - 2x| = |x + 5|$

(5mks)

c) Use Pascal triangle to obtain the value of $(1.002)^5$ correct to 6 decimal places (5mks)

d) Evaluate the following
 I) $\log_4 1$
 II) $\log_2 64$

(5mks)

QUESTION FOUR (20 MKS)

a) Simplify
 i) $5 \log^2 - \log 32$
 ii) $\frac{1}{2} \log 49$

b) Write the following fraction in the partial fraction form:

 i) $\dfrac{x-3}{x^3 + 2x^2}$

 ii) $\dfrac{5x + 8}{x^2 + 4x + 4}$

(6mks)

c) Evaluate the following:
 i) $7 p_3$
 ii) $8 p_6$

(4mks)

d) (i) What is the meaning of a combination in mathematics? (2mks)

(ii) Evaluate the following:
    a) $6c_3$
    b) $5c_5$

(4mks)

Question five (20 mks)

(a) Find the mean and standard deviation of the following data:

Class	1-5	6-10	11-15	16-20	21-25
frequency	14	9	11	10	6

(8mks)

(b) Use matrices method to solve the following equation:

$2x + 3y = 2$

$3x - 5y = 22$

(4mks)

(c) Evaluate

$$\int_0^{2/3}(x^4 + 3)dx$$

(3mks)

(d) Show that $3^0 = 1$ (3mks)

(e) Find the first derivative of the following function:

$Y = x^3 + 3x^2 + 7x + 8$

(2mks)