KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMMERCE AND BACHELOR OF EDUCATION

COURSE CODE: MATH 100

COURSE TITLE: GENERAL MATHEMATICS

STREAM: Y1S1

DAY: FRIDAY

TIME: 2.00 – 4.00 P.M.

DATE: 26/11/2010

INSTRUCTIONS:

- Answer question ONE and any other TWO questions
- Begin each question on a separate page
- Show your workings clearly

PLEASE TURNOVER

QUESTION ONE (30 MARKS)

a) Solve the following equations for x

i) $\frac{2}{x+2} = 2 - \frac{10}{4x-8}$ **(5 marks)**

ii) $x + 6 + \frac{6}{x-2} = \frac{8-x}{x-2}$ **(5 marks)**

iii) $X^2 + 6x + 9 = 0$ **(3 marks)**

iv) $\text{Log}_2(x+5) + \log_2(x+2) = \log_2(x+6)$ **(4 marks)**

v) $\text{Log}_{10} 5 - 2 + \log_{10}(2x+10) = \log_{10}(x-4)$ **(4 marks)**

vi) $10x - 14 > 6x + 18$ **(3 marks)**

b) Find the determinant of the following matrices

i) $\begin{pmatrix} 3 & 6 \\ 4 & 8 \end{pmatrix}$ (3 marks) ii) $\begin{pmatrix} 1 & 4 & 7 \\ 3 & 9 & 12 \\ 11 & 4 & 2 \end{pmatrix}$ **(4 marks)**

QUESTION TWO (20 MARKS)

a) Given the matrices $A = \begin{bmatrix} 0 & 9 \\ 2 & -3 \\ -1 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 8 & 1 \\ -7 & 0 \\ 4 & -1 \end{bmatrix}$ $C = \begin{bmatrix} 2 & 3 \\ -2 & 5 \\ 10 & -6 \end{bmatrix}$

Compute 3A + 2B – 1/2C **(6 marks)**

a) Differentiate and intergral the following function

i) $\frac{dy}{dx} = (3x^2 + 2)^4 (6x^2 + 4)^5$ at x = 1 **(7 marks)**

ii) $\frac{dy}{dx} = \frac{(4x^2 + 4)^3}{(x+5)^2}$ at x = 1 **(7 marks)**

QUESTION THREE (20 MARKS)

a) Intergrate the following functions

i) $\int x^6 + 2x^3 + 4 \quad dx$ **(3 marks)**

ii) $\int 4x^5 + 6x^2 + 4x\,dx$ **(3 marks)**

b) Differentiate the following by first principles

i) $f(x) = 8x^2+4$ **(4 marks)**

ii) $f(x) = 10x^2+ 5x - 2$ **(4 marks)**

c) Use completing square method to solve the followingquadratic functions

i) $2x^2 + 6x + 7 = 0$ **(3 marks)**

ii) $3x^2 - 2x - 1 = 0$ **(3 marks)**

QUESTION FOUR (20 MARKS)

a) A bag contains 9 white balls and 6 red balls. Two balls are drawn one after the other with replacement and Without replacement

i) Find the probability of drawing two red balls **(3 marks)**

ii) Find the probability of drawing balls of different colours **(4 marks)**

a) Evaluate $\lim_{x\to 3}(3x^4 + 5x^2 + 4)$ **(3 marks)**

b) $\lim_{x\to\infty}\left(\frac{2x^5 - x^3 - 1}{6x^3 + 2x^2 - 7}\right)$ **(4 marks)**

c) In a survey on people's income in one district, it was found that income is normally distributed with a mean of Ksh 98,000 and a standard deviation of Ksh 16000. If a person is chosen at random, what is the probability that the persons income is

i) Greater than Ksh 50,000 **(2 marks)**

ii) Less than 70,000 **(2 marks)**

iii) Between 120,000 and 130,000 **(2 marks)**

QUESTION FIVE (20 MARKS)

Class interval (Salary in 000's)	frequency (no. of workers)
0 – 9	1
10 – 19	8
20 – 29	12
30 – 39	11
40 – 49	12
50 – 59	11
60 – 69	19
70 – 79	12
80 – 89	8
90 – 99	6

a) Mean **(4 marks)**
b) Variance **(2 marks)**
c) Standard Variance **(4 marks)**
d) Coefficient of variation **(2 marks)**
e) Mode **(4 marks)**
f) Median **(4 marks)**