KABARAK UNIVERSITY

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF THEOLOGY

COURSE CODE: **MATH 001**

COURSE TITLE: **BASIC MATHEMATICS**

STREAM: **Y1S1**

DAY: **TUESDAY**

TIME: **2.00 – 4.00 P.M.**

DATE: **11/08/2009**

INSTRUCTIONS:

Answer Question **ONE** and any other **TWO** Questions.

PLEASE TURN OVER

QUESTION ONE (30 MARKS)

(a) Consider the following data on the attendance of Sunday school;

3, 5, 5, 8, 9, 10, 12, 13, 15, 20,

Calculate;

(i) The mean $\bar{}$ **(2 marks)**

(ii) The variance **(3 marks)**

(iii) The standard deviation **(1 mark)**

(b) Find the value of for the equation $2 = \frac{1}{32}$ **(3 marks)**

(c) Evaluate the following

(i) $6p_6$

(ii) $7p_3$

(iii) $8c_4$

(iv) $5c_5$ **(8 marks)**

(d) Given the equation of a line is $= 4 + 6$. What is;

(i) Its gradient **(1 mark)**

(ii) Its y – intercept **(1 mark)**

(iii) The gradient of a line parallel to this line. Give reason for your answer. **(2 marks)**

(e) Solve the following using matrix method;

$2 + 3 = 2$

$3 - 5 = 22$ **(4 marks)**

(f) Evaluate $\int (+ 3)$ **(3 marks)**

(g) Determine the simple interest on Ksh. 4800 at 4% p.a. for 4 years. **(2 marks)**

QUESTION TWO (20 MARKS)

(a) Define the term statistics. **(2 marks)**

(b) The Age of 40 members of a local church are shown in the table below;

Age	11 – 14	15 – 18	19 – 22	23 – 26	27 – 30	31 – 34
No. of Members	0	8	16	11	4	1

Determine the mean age **(5 marks)**

(c) Find the value of — **(4 marks)**

(d) Express the following in logarithmic notations

(i) $2 = 16$

(ii) $1728 = 12$

(iii) $9 = 27$ **(3 marks)**

(e) Show that;

(i) $\tan 60 = \sqrt{3}$

(ii) $\cos 30 = \frac{3}{2}$ **(3 marks)**

using a suitable triangle.

(f) Show that $3° = 1$. **(2 marks)**

QUESTION THREE (20 MARKS)

(a) Four persons are to the selected for the board of directors of a local hospital. If twelve candidates have been selected, how many different groups of four could be selected for the board? **(4 marks)**

(b) President Kibaki would like to visit seven provinces prior to the next general election date. However, it will be possible for him to visit only three provinces of the country. How many different itineraries can he and his staff consider? **(3 marks)**

(c) Find the second derivative of the function = (+ 4) **(4 marks)**

(d) Simplify the following indices:

(i) ( )

(ii) $\frac{5^3 \cdot 5^8}{5^6}$

(iii) . . **(5 marks)**

(e) Calculate the amount to be paid after 6 years if Sh. 65,000 is borrowed at 11% simple interest p.a. **(4 marks)**

QUESTION FOUR (20 MARKS)

(a) Pastor Kioko borrowed a sum of money at 12% simple interest p.a. to finance a church project. After 5 years, he paid Ksh. 128,000. Calculate the sum of money borrowed. **(5 marks)**

(b) A church plans to buy a van after 3 years. The van is expected to cost Ksh. 220,000. The members raised sh. 80,000 and deposited this amount at the beginning of the year. At the beginning of second year they managed to deposit Ksh. 40,000. Calculate the amount they must deposit at the beginning of the third year if compound interest is paid at 10% p.a. in order to be able to buy the van. **(10 marks)**

(c) Solve the following equations

(i) $\quad - 2 \quad - 48 = 0$ **(3 marks)**

(ii) $3 \quad - 10 = 22 - 5$ **(2 marks)**

QUESTION FIVE (20 MARKS)

(a) Without drawing the lines, state which of the pairs of lines below are perpendicular and which of the pairs are parallel giving reasons for your answer in each case:

(i) $\quad = 4 \quad + 7, \qquad = -\frac{1}{4} \quad + 3$ **(1 mark)**

(ii) $\quad = -x - 1, \qquad = -\frac{2}{7}x - \frac{1}{2}$ **(1 mark)**

(iii) $2 \quad = 4 \quad + 8, \qquad = 2 \quad + 3$ **(2 marks)**

(iv) $3 \quad + 4 \quad = 8, \qquad = -\frac{4}{3} \quad + 2$ **(2 marks)**

(b) Determine the present value of the following amount if the rate of interest is 10%

(i) Sh. 8,000 after 3 years **(2 marks)**

(ii) Sh. 10,000 after 3 years **(2 marks)**

(c) If $= \begin{matrix} 4 & 1 \\ 3 & 2 \end{matrix}$, $= \begin{matrix} 2 & -3 \\ 4 & 4 \end{matrix}$

Compute

(i) **(2 marks)**

(ii) **(2 marks)**

(iii) **(2 marks)**

(iv) $|\quad|$ **(1 mark)**

(d) Evaluate

(i) $-5 + -3$ **(1 mark)**

(ii) 3 + -7 **(1 mark)**

(iii) $-42 - 21$ **(1 mark)**