KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

AND BACHELOR OF SCIENCE IN ECONOMICS AND

MATHEMATICS

COURSE CODE: **MATH 110**

COURSE TITLE: **BASIC MATHEMATICS**

STREAM: **Y1S1**

DAY: **FRIDAY**

TIME: **9.00 – 11.00 A.M.**

DATE: **11/12/2009**

INSTRUCTIONS:

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

PLEASE TURN OVER

QUESTION ONE (30 MARKS)

(a) Verify the distribution rule of union over intersection by use of a truth table. **(8mks)**

(b) (i) Write short notes on the following;

I) Union set **(2 mks)**
II) Intersection set **(2 mks)**
III) Universal set **(2 mks)**

(ii) Eliminate A from x = asin A and y = btanA **(7 mks)**

(c) Given $f(x) = 4x^2 - 5x + 8$
Find $f^{-1}(x)$ **(4 mks)**

(d) Show that $\sqrt{2}$ is an irrational number. **(5 mks)**

QUESTION TWO (20 MARKS)

(a) State De`morgans Laws and hence prove them by reasoning technique **(14mks)**

(b) Prove that $\sum_{j^1=1}^{n} j^3 = \frac{n^2(n+1)^2}{4}$ By mathematical induction **(6 mks)**

QUESTION THREE (20 MKS)

(a) Derive the following;
(i) The sum of a A.P. **(5 mks)**
(ii) Sum of G.P. **(5 mks)**
(iii) Sum to infinity **(5 mks)**

(b) Express the following in lowest form

(i) $0.\dot{4}\dot{5}$ **(2 mks)**

(ii) $0.0\dot{7}$ **(3 mks)**

QUESTION FOUR (20 MKS)

(a) Prove that;

cosA+cosB+cosC-1=4sinA/2sinB/2sinC/2 **(13 mks)**

(ii) $\frac{Cos\theta Sin^2 + Cos^3}{Sin\theta} = \frac{1}{ten\theta}$ **(1mks)**

(b) Derive cosine Rule **(4mks)**

QUESTION FIVE (20 MARKS)

(a) Define the following terms;

i) Permutation **(2 mks)**

ii) Combination **(2 mks)**

(b) How many 3 digit number formed from 1, 2, 3, 4, 5, 6

(i) If repetition is allowed **(2 mks)**

(ii) Without repetition **(2 mks)**

(c) There are 3 boys and 4 girls at a birthday party. In how many ways can a team of 5 pupils be formed so as to include at least one boy. **(5 mks)**

(d) Use binomial to expand 1/(1-x) as far as the term in x3= 1 **(7 mks)**