THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
CERTIFICATE IN INFORMATION TECHNOLOGY (CIT/JAN 2012/S-EV)

EIT 1113: FUNDAMENTALS OF MATHEMATICS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions
Answer any **THREE** questions. Question **ONE** is Compulsory
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (20 marks)

Question One (20 Marks)

a) Solve the following equations:

$$4x + 3y = 120$$

$$5x + 6y = 150$$

i. (4 marks)

$$2x^2 + 6x + 8 = 0$$

ii. (3 marks)

b) Evaluate the following:

$${}^4P_2 \ *^6 C_2$$

i. (3 marks)

$${}^5P_2 \ *^5 C_3$$

ii. (3 marks)

c) If $(2a - b)^{20}$ is expanded in ascending powers of b find:

i. The 1st five terms of the series (4 marks)

ii. The 7th term of the powers of 2a (3 marks)

SECTION B (Answer any TWO questions – 40 Marks)

Question Two (20 marks)

$$M = \begin{matrix} -5 & 10 & 8 \\ 4 & -7 & -6 \\ -3 & 6 & 5 \end{matrix} \qquad N = \begin{matrix} -1 & 2 & 4 \\ 2 & 1 & -2 \\ -3 & 0 & 5 \end{matrix}$$

a) Show that if matrix and matrix
The MN = NM = 1 where I is the 3*3 unit matrix (16 marks)

b) Using matrix N above determine its determinant (4 marks)

Question Three (20 marks)

The masses of students in a CIT class are given below:

Mass in Kg	f
40 – 49	1
50 – 59	3
60 – 69	17
70 – 79	14
80 – 89	9
90 – 99	6

i. Calculate the mean (6 marks)

ii. Calculate the variance (8 marks)
iii. Determine the standard deviation (6 marks)

Question Four (20 marks)

a) Solve the following equation

$$\frac{2}{1+3x}-\frac{1}{2-x}=\frac{3}{7}$$

(7 marks)

b) Convert the following numbers to the indicated bases:
   i. $20BE_{16}$ to decimal
   ii. 764_{8} to binary
   iii. 956_{10} to hexadecimal (9 marks)

c) Express the number 239_{8} to denary (3 marks)