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 JAN2012/S-FT)

EIT 1113: FUNDAMENTALS OF MATHEMATICS

END OF SEMESTER EXAMIANTION

SERIES: APRIL 2012
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FOUR** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question One (20 Marks)

a) Evaluate the following

(i) $^{10}C_4$

(ii) $^{9}P_3$ (4 marks)

b) Solve the following equations:

(i) $4x^2 - 6x - 10 = 0$ (3 marks)

(ii)
$$8x + 15y = 150$$
$$12x - 6y = 160$$
(3 marks)

c) Calculate the value of $(1.002)^5$ correct to four places of decimal using the binomial theorem. (5 marks)

d) Given that matrix P = $\begin{bmatrix} 3 & 4 \\ -4 & 3 \end{bmatrix}$ and matrix A = $\begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$

Find matrix M where $M = P^T \times AP$ (5 marks)

SECTION B (Answer Any Two Questions)

Question Two (20 marks)

Given that A is the matrix $\begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & -1 \\ 1 & 1 & 2 \end{bmatrix}$ and B is matrix $\begin{bmatrix} 1 & -2 & -1 \\ -3 & 2 & 1 \\ 1 & 0 & -1 \end{bmatrix}$

a) Find the product AB (4 marks)

b) Evaluate the following with respect to matrix A

(i) Det A (3 marks)

(ii) Co-factor matrix C (8 marks)

(iii) The inverse of A i.e. A^{-1} (5 marks)

Question Three (20 marks)

a) Express the following numbers to denary:

(i) 254.452_8 (4 marks)

(ii) 2163_8 (3 marks)

(iii) 1101.011_2 (3 marks)

b) Convert the following numbers into the indicated bases

(i) (110111) to decimal

(ii) $(2C)_{16}$ to octal

(iii) $(726)_{10}$ to octal (10 marks)

Question Four (20 marks)

The number of days the workers of a certain factory are absent in a year are as follows:

45	40	57	44	38	39	42	55	20	45
31	59	37	47	32	22	62	66	57	43
40	11	43	42	33	41	35	33	53	27
25	38	51	46	39	65	17	41	48	32
26	34	32	45	54	65	32	65	63	47

(i) Prepare a frequency distribution table for grouped data, use classes i.e (10 – 19, 20 – 29 etc) (6 marks)

(ii) Calculate the mean (6 marks)

(iii) Calculate the standard deviation (8 marks)