THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING
HIGHER DIPLOMA IN BUIDLING & CIVIL ENGINEERING

EBC 2315/AMA 3101: COMPUTER PROGRAMMING

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** 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 1

a) Describe the following computer programming terms (6 marks)
   (i) Algorithm
   (ii) Pseudo code
   (iii) Flow charts

b) (i) Outline **THREE** types of programming errors and their effects. (6 marks)

$$\frac{1}{\sqrt{2\pi}}\int_{X_N}^{X_0} e^{-x^{2/2}}\,dx$$

(ii) Write a program to evaluate , the area under the curve using Simpson's rule $\left(A = h/3\left\{\left(1^{st} + last\ ordinates\right) + 4\left(ODD\ Ordinates\right) + 2\left(EVEN \quad Ordinates\right)\ \right\}\right]$ (6 marks)

c) Write out the output of the following program (8 marks)

```
10    X = 2
20    M = 5
25    L = 2
30    A = X*X
40    X = X +2
50    A = A*M
60    PRINT A, X, L, M
65    M = M*L
70    IF X < 10 THEN 40
80    END
```

SECTION B (Answer *any TWO questions from this section*)

Question 2

a) Write a program in BASIC to evaluate the value of sin *x* form the series

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + ...$$

by summing the first six terms (10 marks)

$$x_1 = x_0 - \frac{f\left(x_0\right)}{f\left(x_0\right)}$$

b) The Newton-Raphson's approximation is given by where x_0 is the estimate and x_1 the improved estimate. Write a program to evaluate the square root of a number from the

$$f(x) = x^2 - c = 0$$

quadratic relationship using 10 iterations (10 marks)

Question 3

a) Write a computer program in BASIC using the "IF……THEN" statement to output prime numbers less than 10. (14 marks)

b) Differentiate the following terms:

(i) Nested Loop and Statement
(ii) Compiler and Interpreter
(iii) Definite and Indefinite repetition (6 marks)

Question 4

$$\frac{3}{4}+\frac{5}{4^2}+\frac{7}{4^3}+.....$$

a) Write a program in BASIC to evaluate the series using the first five terms (9 marks)

b) Using the INT() function write a program to convert hours in decimal to Hours, Minutes and Seconds (5 marks)

c) Write the output of the following program. (6 marks)

```
10    X = 2
20    FOR Y = 1 TO 5
25    X =  X +2
30    FOR J = 1 TO 3
40    Z = X*Y
50    PRINT X, Y, J, Z
60    NEXT J
70    NEXT Y
80    END
```

Question 5

a) Write a program to evaluate the factorial of any given number (12 marks)

b) Explain the following programming terms:

(i) Syntax
(ii) Loop
(iii) Self-replacement statement
(iv) Illegal function call (8 marks)