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

EBC 2315: 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) Explain the following terms as applied in programming

(i) Loop
(ii) Flow chart
(iii) Syntax
(iv) Self-replacement statement (8 marks)

b) Write the output for the following program (8 marks)

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

c) Outline **FOUR** types of programming errors stating the effect caused by each (8 marks)

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

d) Write a program to evaluate the roots of a quadratic equation given that

(12 marks)

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

Question 2

a) Briefly explain the functions of an operating system (6 marks)

b) Differentiate between the following computing terms (6 marks)

(i) BIT and BYTE
(ii) RAM and ROM
(iii) OMR and OCR

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

(i)
```
10    Y = 3
20    P =7
30    L = 5
```

```
40      A = Y * Y
50      Y = Y + 4
60      A = A* P
70      PRINT A, Y, L, P
80      P = P * L
90      IF Y < 10 THEN 50
100     END
```

Question 3

a) Explain **FIVE** properties of a good application program applied to solve a civil engineering program (8 marks)

b) Write a computer program in BASIC using the "IF……..THEN" statement to output prime numbers less than 14 (12 marks)

Question 4

a) A contractor wants to determine the factorial of odd numbers. Design a programme that can evaluate the factorial of any number (10 marks)

$$\sin t = t - \frac{t^3}{3!} + \frac{t^5}{5!} - \frac{t^7}{7!} + \frac{t^9}{9!} t.....$$

b) Write a program in BASIC to evaluate the following series
Assume first five terms (10 marks)

Question 5

a) Explain the following terms as applied in computer programming

(i) Interpreter
(ii) Compiler
(iii) Operating system
(iv) Pseudo code

b) Write a program to evaluate the deflection δ for a cantilever using the relationship (12 marks)
Where:

$$\delta = \frac{3\sigma(1-v)}{E}\left(\frac{l}{t}\right)^2$$

Where σ = Applied stress
V = Poisson's ratio
E = Young's Modulus

L = Length of a beam
T = cantilever thickness