THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSIT M1/BITIT J12)

ICS 2104/EIT 4108:
OBJECT ORIENTED PROGRAMMING I
FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2012
TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*
This paper consist of **FIVE** questions
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Briefly describe the following features of object-oriented programs:
  (i) Encapsulation   **(2 marks)**
  (ii) Polymorphism   **(2 marks)**
  (iii) Data Abstraction   **(2 marks)**

b) Enumerate at least **THREE** differences between procedural programming and object-oriented programming.   **(3 marks)**
c) Differentiate between the following:
  (i) Base Class and Derived Class   **(4 marks)**

(ii) Local Variable and Global Variable **(4 marks)**
(iii) Prefix Operators and Postfix Operators **(4 marks)**

d) Write a segment of code that gets the sum of all numbers between 100 and 300 that are divisible by 5 using the:
(i) Do…..while loop **(5 marks)**
(ii) For…..Loop **(4 marks)**

Question Two

With the use of Java code fragments, implement the following features of object-oriented paradigm:

(i) Inheritance **(5 marks)**
(ii) Polymorphism **(5 marks)**
(iii) A class to hold student details and calculate student marks. **(5 marks)**
(iv) A statement to instantiate **TWO** objects of the class defined in Question 2 (iii) above and initiate them with appropriate values. **(5 marks)**

Question Three

a) Using appropriate examples, describe the **THREE** control structure in Java programming Language. **(9 marks)**

b) There are **TWO** major types of Java Programs. List the **TWO** types and explain how they differ from one another. **(6 marks)**

c) Explain the main differences between the do…while statement and the while….statement. **(5 marks)**

Question Four

Write a program that uses a class employee to display an employee's information. The class should include the following members:

Data numbers (Employee number, Employee name, basic salary, house allowance, medical allowance, income tax)

Member functions (to read values, to calculate gross salary, to display values) **(20 marks)**

Question Five

a) Define the following:
(i) Constructor **(3 marks)**
(ii) Method **(3 marks)**

b) Write a program that uses a class named circle to accept the radius of a circle and compute both the area and circumference (area = pi* radius* radius, circumference = Pi* diameter)
(14 marks)