TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INFORMATION AND

COMMUTICATION TECHNOLOGY

EIT 4108 : FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY 2016

TIME: 2 HOURS

DATE:

Instructions to Candidates
You should have the following for this examination
 -*Answer Booklet, examination pass and student ID*
This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

Question ONE

(a.)   Is encapsulation, information hiding? If yes, explain how, otherwise distinguish between these terms. As you discuss give the constructs in Java that are used to implement each.

(6 marks)

(b.)   Outline the three properties that characterize any software object.

(3 marks)

(c.)   (i.)   What does the acronym API stand for? Give.

(1 mark)

(ii.)   In which Java API are all standard stream objects defined? Give.

(1 mark)

(iii.)   In which Java API is the JFrame class defined? Give.

(1 mark)

(d.)   (i.)   Which operating system environment variable do we set to be able to use the Java SDK? Give.

(1 mark)

(ii.) What value do we assign to the system environment variable in (i.)? Give (assume a default installation).

(1 mark)

(e.) (i.) What is a method?

(1 mark)

(ii.) As you explain in (i), give the general syntax of a method definition and describe the syntax elements that constitute the method header.

(5 marks)

(iii.) Write a method definition within an application class, that accepts as its arguments; an array of integers values and the size of the array. The function should scan the array and determine the position (note: not the index) of the element in the array having the smallest value. The function should return the position of the element that has the smallest value.

(10 marks)

Question TWO

(a.) Briefly distinguish between an accessor and a mutator method. As you distinguish give the general syntax of a prototype for each type of method.

(4 marks)

(b.) Distinguish between the two terms a class method and instance method.

(4 marks)

(c.) The following code excerpt of a Product class

```
public class Product
{
    //attributes
    private String serialNo;
    private String description;
    private float sellingPrice;
    private float discount;
    ...


}
```

(i.) Write a constructor which will accept four parameters and whose values will be used to assign the corresponding instance variables of the Product class.

(ii.) Write an accessor and mutator method for each of the instance variable of the Product class above.

(12 marks)

Question THREE

(a.) With the aid of a diagram, describe the hierarchy of Swing components.

(5 marks)

(b.) Outline the steps that we can use to create a simple GUI desktop application.

(6 marks)

(c.) Write a Java application class that creates a frame with the title "This is an Exam . . ." and a command button, which when clicked will display a dialog box with a message "Hello, Kenya! It's a new beginning.".

(9 marks)

Question FOUR

(a.) (i.) Define the term inheritance.

(ii.) Distinguish between the terms generalization and specialization as used in inheritance.

(6 marks)

(b.) (i.) There are two ways we can inherit properties from a parent class to a child class namely; privately or publicly. Briefly explain how these two ways of inheriting properties from parent class work.

(ii.) How do we call the parent class constructor in a child class constructor? Outline. As you outline give the general syntax of the expression.

(8 marks)

(c.) With aid of an example, explain the meaning for each of the following terms:

(i.) method overriding

(ii.) method overloading

(6 marks)

Question FIVE

(a.) (i.) What is a class? Explain.

(ii.) Briefly describe the components that make up a class.

(iii.) Give the general syntax for a class definition.

(8 marks)

(b.) (i.) How would you create an object? Give the general syntax and explain each construct in the syntax.

(ii.) The following are the declarations of two constructors of a class called Car:

```
Car(String regno, String make, float engCap);

Car(String regno, String make);
```

Show how you would instantiate a ford car which has registration number N155MRG and an engine capacity of 1.6 litre. Which constructor would be invoked implicitly and why? Explain.

(iii.) Outline the syntax for invoking a member method of an object.

(10 marks)

(c.) Why is the main method in an application class defined with a scope modifier static? Explain.

(2 marks)