# MACHAKOS UNIVERSITY COLLEGE

**(A Constituent College of Kenyatta University)**
**University Examinations for 2015/2016 Academic Year**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY**

**FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**SIT 203: OBJECT ORIENTED PROGRAMMING**

**Date: 10/8/2016** **Time: 2:00 – 4:00 PM**

**INSTRUCTIONS**

- **Answer QUESTION I and any other TWO QUESTIONS**
- **This is a CLOSED BOOK EXAM, no reference materials allowed**
- **No use of mobile phones, no electronic calculators**
- **Write your answers legibly and use your time wisely.**

**QUESTION ONE (30 MARKS)( COMPULSORY)**

a) Explain the meaning and use of the following object oriented programming concepts:

i) interface (2 marks)

ii) Abstract class (2 marks)

b) With use of sketches to illustrate your answer, explain the concept of inheritance as used in object oriented programming. (6 marks)

c) Make use of class examples to show the difference between local and global variables. (4 marks)

d) Explain the difference between a constructor and a method. (2 marks)

e) Differentiate between an infinite loop and an Off-by-one error (OBOE). (4 marks)

f) Write a complete program that calculates and prints the product of three integers. The program should accept all inputs from the keyboard and then calculate and display the product of the numbers. (10 marks)

**QUESTION TWO (20 MARKS)**

a) What are exceptions? Explain any three types of java exceptions. What is the remedy to exceptions? (5 marks)

b) What is an access modifier? Explain the basic class access modifiers that can be implemented in any java program. (4 marks)

c) Using example java code, show how the "this" keyword can be used in THREE different ways in the java language (6 marks)

d) Explain the call-by value scheme used in java to invoke methods. (5 marks)

**QUESTION THREE (20 MARKS)**

a) Using example code snippets, show the rules of overloading a method. (4 marks)

b) Programming and scripting are said to be two different things. Explain the difference between java programming and JavaScript. (2 marks)

c) Write a statement to declare and instantiate an array to hold marks obtained by students in different subjects in a class. Assume that the class can hold up to 60 students and there are 8 subjects (3 marks)

d) The Java language is said to be *distributed* and *multithreaded*. Explain the italicized concepts. (4 marks)

e) Explain the similarities and differences between Java and other programming languages with respect to code compilation. (4 marks)

f) What is the work of the static keyword in Java programming? When do we declare a member of a class static? (3 marks)

**QUESTION FOUR (20 MARKS)**

a) Explain why the main method in any Java class has to be declared static (i.e. public static void main(String [] args))? (3 marks)

b) What output is produced by the following program segment? Explain your answer.(7 marks)

```
int i;
boolean startWord;
name = "Richard M. Nixon";
startWord = true;
for (i = 0; i < name.length(); i++) {
if (startWord)
System.out.println(name.charAt(i));
if (name.charAt(i) == ' ')
startWord = true;
else
startWord = false;
}
```

c) By means of appropriate diagrams, differentiate between object creation and object Declaration. (4 marks)

d) Using examples, differentiate between class methods and instance methods (6 marks)

**QUESTION FIVE (20 MARKS)**

a) Determine how many times the body of this loop is going to be executed

```
int x = 5;
int y = 50;
while ( x <= y)
{
x = y/x;
}
```

Explain your answer. (4 marks)

b) Explain at least THREE different layout managers available in the javax.swing package. (6 marks)

c) Using appropriate examples, explain the difference between overriding and overloading of methods in java. (4 marks)

d) Below is some Java code

```
X=1;
Y=1;
If ( n>0)
X= X+ +;
Y= - -Y;
```

What will be the values of X and Y after the code is executed if the values of n are

i. 1 (3 marks)

ii. 0 (3 marks)

Explain your answers