NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
Examination January 2012

SUBJECT: OBJECT ORIENTED PROGRAMMING
CODE: SCS 4102

Instructions to candidate:

1. Answer any four questions. Paper contains five questions.
2. All programming questions to be answered in the Java language   DURATION 3HRS

QUESTION ONE

   a) Define the following terms including code examples;

i) Instance variable   [3]
ii) Static variable   [3]
iii) Local variable   [3]

   b) Using the appropriate code syntax pro-grammatically illustrate the concept of ***"constructor chaining"***   [6]

   c) Outline the output of the following snippet of code and what adjustments could be made for optimal functionality;   [10]

```
    final char a = 's', final char b;
    b = 'c';

    switch('g') {
            case a: System.out.println("This is  a");
            default: System.out.println("This is  b");
            case c: System.out.println("This is  d");
            case f: System.out.println("This is  e");
            case e: System.out.println("This is  f");
    }
```


QUESTION TWO

a) Multiplication is successive addition. A x B can be translated to A plus itself B times. Develop a comprehensive program that illustrates this point using appropriate Object Oriented Programming Concepts. The program must capture user input.   [20]

b) Discuss the concept of method overloading.   [5]

QUESTION THREE

To illustrate the usefulness of abstract classes develop an abstract class called FourSides. This abstract class should contain the following abstract methods area (), perimeter (), getWidth(), getLength(), setWidth() and setLength(). Also develop three concrete classes Rectangle and Square which inherit FourSides and a TestShape class which instantiates two objects of Rectangle and Square and calculates the area and perimeter.   [25]

QUESTION FOUR

Develop a program that prompts the user for two integers. Your program should then present the user with a menu of characters, a (A), s(S), m (M) , d(D) and x(X). If the character is A, add the two integers, s subtract the second number from the first, m multiply the two numbers, d divide the first by the second and x exit. The program should display the answer.
                                                                                           [25]

QUESTION FIVE

Outline the outputs of the following snippets of code

a)   public class Person {

          String name = "No name";

          public Person(String nm) { name = nm; }

          }

          public class Employee extends Person {

          String empID = "0000";

```java
public Employee(String id) { empID = id; }

    }




    public class EmployeeTest {

    public static void main(String[] args){

    Employee e = new Employee("4321");

    System.out.println(e.empID);

    }

    }
```
                                                                    [10]

b)
```java
    public class Barn {

    public static void main(String[] args) {

    new Barn().go("hi", 1);

    new Barn().go("hi", "world", 2);

    }

    public void go(String... y, int x) {

    System.out.print(y[y.length - 1] + " ");


    }

    }
```
                                                                    [5]

c)   The following snippet of code is construed with errors. Identify the errors and rewrite
      the class to compile stating the output.   [10]

```java
private class Test {

public  void main(String.. args) {

int x == 5;

boolean b1 = true;

boolean b2 = false;

if ((x = 4) && !b2 )

System.out.print("1 ");

System.out.print("2 ");

if ((b2 = true) && b1 )

System.out.print("3 ");

    }

}
```