Department of Computer Science

University of the Western Cape

COS 101

Practical Test 1

Total [50] ***Time[2 hours]***

Question 1 **[15]**

Develop a Java program to calculate the LCM (Lowest Common Multiple) of two positive integers. For example, the LCM of 12 and 9 is 36. See algorithm below:

CalculatingTheLCMofTwoNumbers

<table>
<tr><td colspan="4">Enter the numbers; No1, No2</td></tr>
<tr><td colspan="4">Initialize multipliers m1 and m2;
m1 ← 1, ✓ m2 ← 1✓</td></tr>
<tr><td colspan="4">Reset flag Found;
Found ← false✓</td></tr>
<tr><td></td><td colspan="3">\T m1*No1 = m2 *No2? ✓ /F</td></tr>
<tr><td></td><td colspan="2">Set flag Found;
Found ← true✓

Store the LCM;
LCM ← m1*No1</td><td>\T m1*No1< m2 *No2? ✓ /F
Increment m1; ✓
m1 ← m1 + 1
Increment m2; ✓
m2← m2 + 1</td></tr>
<tr><td></td><td colspan="3">Repeat until Found✓</td></tr>
<tr><td colspan="4">Display the LCM of No1 and No2 is ; LCM✓</td></tr>
</table>

Mark Allocation:		
Code	**:**	**10**
Compile and Run	**:**	**5**

Question 2 [20]

Write a java program to calculate the Area of a rectangle using the following formula

Area = Length * Width.

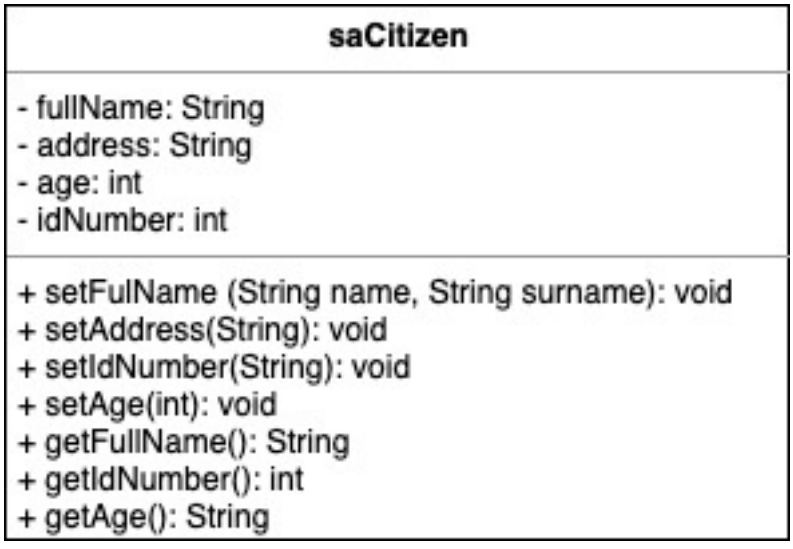
You program should have the following methods:

1. getValues - method that will force a user to enter positive values for both length and width of a rectangle. In other words, the execution of the method must only end once both variables have been provided positive values.
2. calcAreaOfRectangle - method return the value of the Area calculated to the main method, where its called/invoked from. Use print statement to call this method and display the area with appropriate text.

Mark Allocation:		
Code	**:**	**14**
Compile and Run	**:**	**6**

Question 3 [15]

Write a java class program to implement the saCitizen UML diagram below:



Use the following program (saCitizenDriver.java – attahed on Ikamva) to test you saCitizen class object.

```
import java.util.*;

public class saCitizenDriver
{
public static void main(String[] args)
{
   public static void main(String[] args)
   {
    Scanner keyboard = new Scanner(System.in);
```

```
    System.out.println();
    System.out.println("Initialising Citizen Database");
    System.out.println("Creating Citizen 1");
    System.out.println();

    saCitizen citizen1 = new saCitizen();

    System.out.println("Enter your name: ");
    String name = keyboard.nextLine();

    System.out.println("Enter your surname: ");
    String surname = keyboard.nextLine();

    citizen1.setFullName(name,surname);

    System.out.println("Enter your SA ID Number: ");
    String idNumber = keyboard.nextLine();

    citizen1.setIDnumber(idNumber);

    System.out.println("Enter your age: ");
    int age = keyboard.nextInt();
    citizen1.setAge(age);

    System.out.println("Enter your current address: ");
    String address = keyboard.nextLine();

    citizen1.setAddress(address);

   System.out.println("Citizen 1 "+citizen1.getFullName()+" lives at
"+citizen1.getAddress()+"\n"+"is "+citizen1.getAge()+" and has the following ID Number
:"+citizen1.getIDnumber());
    System.out.println("====================================");
  }
}
```