

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
200 level 1st Semester Examination – Jul./Aug. 2016
CST222-3 Object Oriented Programming



Part C

Instructions to candidates:

Duration: Two (02) hour

Number of questions: Three (03)

Answer all questions

Mark allocation: 100

Use Notepad or NetBeans IDE

Create a folder in **Desktop** and rename it with your Examination Number.

(i.e. UWU_EX_13_0001_Q1)

Create separate files for each question inside the folder.

Zip your folder and then upload to the **CMS**.

You are **not allowed** to use any external memory devices during the exam.

1.

- a. If you have N number of eggs, then you have N/144 gross of eggs and N/12 dozen of eggs. Write a Java program that
- Asks the user how many eggs he has
 - Tells the user how many gross of eggs, how many dozen of eggs and how many left over eggs he has

Hint: For N you can take any value you like and mode of N (N%) can be used to calculate the left over number of eggs.

(15 mark)

- b. Using a two (02) dimensional array write a program in java that will print following output on the screen.

```
0 0 0 0 0
0 0 1 2 3
0 1 3 5 7
0 2 5 8 11
```

(10 mark)

- c. When you execute the following program it will generate compilation errors. Correct the code to get the output and show it on the screen.

```
import java.io.*;

class A{
    int a=100;
    public void print(){
        System.out.println("a: " + a);
    }
}
```



```

    }
}
abstract class B extends A{
    int b= 250;
    public void print(){
        System.out.println("b: " + b);
    }

    public void print(int x){
        System.out.println("Now in class B");
    }
    abstract int add();
}

class C extends B{
    int c= 500;
    public void print(){
        System.out.println("c: " + c);
    }
}

class Test{
    public static void main(String[] args){

        A myA= new A();
        B myB= new B();
        C myC= new C();

        myC= myA;
        myC.print();

        myA= myB;
        myA.b= 200;
        myA.print();
        myA.print(120);

        myB=myC;
        myB.add();
    }
}

```

(15 mark)

2. A university wishes to keep information about its students. The proposed Student class has the following instance variables.

Student_Name : String
Student_Number : String
Student_ID : String
Credit_Points : integer

Credit_Points represent the pass/ fail qualification achieved by a student, which is a number between 0 and 4. A class variable is also required, called **Numberof_Students**, which will be incremented each time a student instance is created.

Using object oriented concepts, write a Java program to perform following requirements.

- a. Show the declaration of the Student class, including any setter and getter methods. (10 mark)
- b. Declare two constructors as below; both constructors should increment the class variable appropriately.
 - i. The first is the default constructor, that has no parameters, sets the instance variable to "not known" for Strings and 0 for integers.
 - ii. The second constructor takes four (04) parameters, one for each of the instance variables.(10 mark)
- c. Show how both constructors could be used to instantiate an object. (10 mark)

03

- a. You have to design a class hierarchy as shown below.

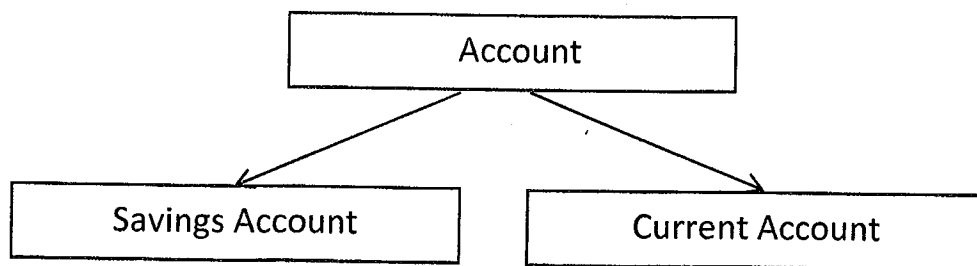
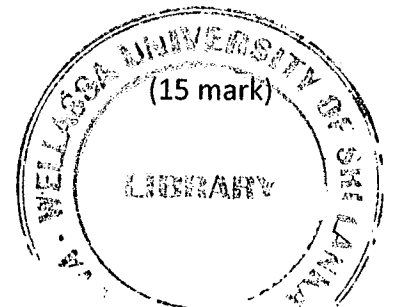


Figure 1: Class Hierarchy of Bank Accounts

The Account class contains the general information about an Account and an abstract method to calculate the yearly interest. For savings account, the interest rate is 10% and for current account the interest rate is 6%. All the member variables of the Account class are initialized through a parameterized constructor. Write a Java program to deposit and withdraw money from savings and current accounts.

(15 mark)



- b. Design a class named **Student** that has two private data as **student_id** and **score**. The class should contain a parameterized constructor to initialize its data member and one method to display the information. Write a Java program that will use an array of Student objects to represent information about Three (03) students. Your program should take input from the keyboard and display the information of the Three (03) students.

(15 mark)