Course Title: Programming II **Date: / / 2014** **No. of Questions: 3 Questions** **Time: 120 minutes** **Using Calculator (No)**	**University of Palestine** **Final Exam** **2013-2014** **Total Grade: 50**	**Instructor Name: Eng. Eman Alajrami** **Student No.: _____** **Student Name: _____** **College Name: _____** **Dep. / Specialist: _____** **Using Dictionary (No)**

First Question **No. of Branches (1)** **5 Marks**

Choose the correct answer:

1. **A subclass inherits _____ from its superclasses.**

a. private data b. protected data c. public data d. a and c e. b and c

2. **When you implement an instance method that is defined in a superclass, you _____ the original method.**

a. overload b. override c. copy d. call

3. **What is item after the following loop terminates?**

```
int sum = 0;
int item = 0;
do {
  item += 1;
  sum += item;
  if (sum > 4) break;
}
while (item < 5);
```

a. 2 b. 3 c. 4 d. 5 e. None of the above

4. **What is the output of running the class C.**

```
public class C {
  public static void main(String[] args) {
    Object[] o = {new A(), new B()};
    System.out.print(o[0]);
    System.out.print(o[1]);
  }
}
class A extends B {
  public String toString() {
    return "A";
  }
}

class B {
  public String toString() {
    return "B";
  }
}
```

a. AB b. BA c. AA d. BB e. None of above

5. **Interfaces can be used to declare constants** which are implicitly

a. public b. static c. final d. all of the above

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Second Question **No. Of Branches (3)** **25 Marks**

Find the output of the following programs:

Program 1:

```
public class Faculty extends Employee  {
    public static void main(String[] args) {
        new Faculty();
    }
    public Faculty()  {
        System.out.println("(4) Performs Faculty's tasks");
    }
}
class Employee extends Person{
    public Employee() {
        this("(2) Invoke Employee's overloaded constructor");
        System.out.println("(3) Performs Employee's tasks ");
    }
    public Employee(String s) {
        System.out.println(s);
    }
}
class Person {
    public Person() {
        System.out.println("(1) Performs Person's tasks");
    }
}
```

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Program 2:

```
class Base {
    public void method(int i) {
        System.out.print("Value is " + i);
    }
}

public class MainClass extends Base {
    public void method(int j) {
        System.out.print("This value is " + j);
    }

    public void method(String s) {
        System.out.print("I was passed " + s);
    }

    public static void main(String args[]) {
        Base b1 = new Base();
        Base b2 = new MainClass();
        b1.method(5);
        b2.method(6);
    }
}
```

……

Program 3:

```
public class Person {
   private String name;
   private Address pAddress;

   public Person (String name, String city, String street, int number, int zip)
  {
      this.name=name;
      pAddress =new Address(city, street, number, zip);
  }
   public Person (String name, Address a)
   {
       this.name=name;
       pAddress = new Address (a);
   }
   public Person (Person other){
      this.name=other.name;
      this.pAddress= new Address (pAddress);
   }
   public void setPAddress(String city, String street, int number, int zip)
   {
      pAddress.setCity(city);
      pAddress.setNumber(number);
      pAddress.setStreet(street);
      pAddress.setZip(zip);
   }
   public String toString(){
       return this.name  + ", " + pAddress;
   }
   public static void main (String[]args){

        Address Home=new Address("New York","5th Avenue", 112, 111);

        Person a=new Person("Carl",Home);

        System.out.println(a);
   }

public class Address {

     private String city, street;
     private int number, zip;

     public Address (String c, String s, int n, int z){
          city=c;
          street=s;
          number=n;
          zip=z;
     }
```

```
public Address (Address a)
{
   this.city=city;
   this.street=street;
   this.number=number;
   this.zip=zip;
}

public Address (String c, String s, int n)
{
   zip=0;
   city=c;
   street=s;
   number=n;
}
public String toString(){
   if (zip==0)
      return "Address: " + street + "st., " + number + ", " + city ;
   else
     return "Address: " + street + "st., " + number + ", " + city  + ", " + zip;
}
```

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Program 4:

```
public class Test {
     public static void main(String[] args) {
        T t1 = new T();
        T t2 = new T();
        System.out.println("t1's i=" + t1.i + " and j=" + t1.j);
        System.out.println("t2's i=" + t2.i + " and j=" + t2.j);
      }
  }
  Public class T {
        static int i = 0;  // Please note that i is static
        int j = 0;
        T() {
          i++;
          j++;
        }
   }
```

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2. Find the error in the following code and correct it

Program 1:

```
public class Test {
  public static void main(String[] args) {
    A a = new A(5.5);
    System.out.println(a.x);
  }
}

public class A {
  private x;
  public void A(double x) {
    this.x = x;
  }
}
```

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Program 2:

```
public  final class C {
   public void f ( )  {   }
}
public class B extends C {
     public void f ( ) {   }
}
```

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3. What is the difference between Overloading and overriding? Give examples?

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Third Question **No. of Branches (2)** **20 Marks**

1)Write a method that returns a new array with no duplicates. The header of the method is as follows:
public static int[] removeDuplicate(int[] x)

For example, if x is {1, 3, 1, 2, 3, 5}, removeDuplicate(x) returns a new array {1, 3, 2, 5}

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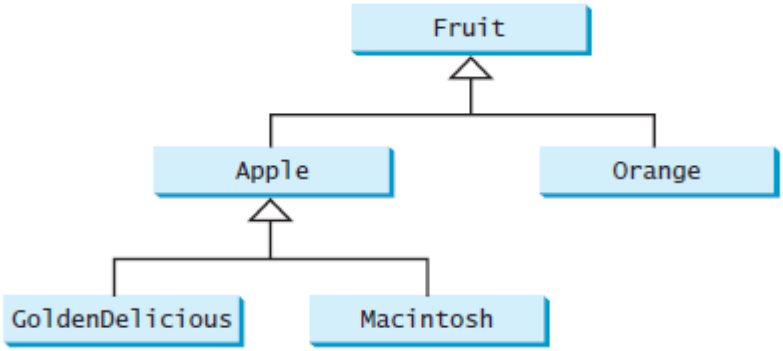
The following tree shows the inheritance hierarchy of fruit types
Fruit is an interface having an abstract method called fruit_type( )
Apple inherits from Fruit, it is an abstract class having two kinds which are GoldenDelicious and Macintosh
Orange is kind of Fruit (inheritance)
Write a complete Java program implementing the tree and use the classes in the main
Declare an array of 3 objects of Apple, the first from Apple, the second from GoldenDelicious, and the third from Macintosh.
(Note you can declare constructor of each class having output statement which prints the class name, or you can declare display method which print out the class name)



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Good Luck