Name_____   Lastname_____   Student number ☐☐☐☐☐☐☐

Object-Oriented Programming
academic year 2009-10

Rules

- This is a closed books exam.
- The operation of any electronic device is prohibited (e.g, no calculator, phone or PDA).
- Answer the questions being *precise, complete,* and *formal.*
- Write as *clearly* as possible, both in terms of handwriting and wording.

Questions

1. What will be printed on the screen if the program with the main function defined as follows is executed? Please provide a short explanation for your answer.

```
1    public static void main(String[] args) {
2        int x = 1;
3        x += 1 + x++ == 1 ? x++ : ++x;
4        System.out.println("x = " + x);
5    }
```

2. What will be the output of the following program:

```
1    class A {
2        public A () { System.out.println("A()"); }
3    }
4
5    class B extends A {
6        public B ()    { System.out.println("B()"); }
7        public B (B b) { System.out.println("B(b)"); }
8    }
9
10   class C extends B {
11       public C ()          { this(new B()); }
12       public C (B b)       { }
13       public C (B b, A c) { super(b); c = this; }
14   }
15
16   public class Task2 {
17       public static void main(String[] args) {
18           System.out.println("1:");
19           C a = new C();
20           System.out.println("2:");
21           A b = new C(a, a);
22       }
23   }
```

3. What will be the output of the following program:

```
1    class X {
2        void dosmth(Object obj) { System.out.println("X:Object"); }
3        void dosmth(Double obj) { System.out.println("X:Double"); }
4        void dosmth(int obj)    { System.out.println("X:int"); }
5        void dosmth(double obj)  { System.out.println("X:double"); }
6
7        void dosmth(char obj) { System.out.println("X:char"); }
8        void dosmth(byte obj)  { System.out.println("X:byte"); }
9    }
10
11   class Y extends X {
12       void dosmth(float obj)  { System.out.println("Y:float"); }
```

1

```java
13        void dosmth(Integer obj) { System.out.println("Y:Integer"); }
14        void dosmth(int obj)     { System.out.println("Y:int"); }
15    }
16
17    public class Task3 {
18        public static void main(String[] args) {
19            X x = new X();
20            Y y = new Y();
21            X z = new Y();
22
23            System.out.println("1:");
24            x.dosmth((byte)0 + (char)0);
25            y.dosmth((byte)0);
26            y.dosmth((char)0);
27            z.dosmth((byte)0 + (char)0);
28
29            System.out.println("2:");
30            x.dosmth((Integer)0);
31            y.dosmth((Integer)0);
32            z.dosmth((Integer)0);
33
34            System.out.println("3:");
35            x.dosmth(0.0f);
36            y.dosmth(0.0f);
37            z.dosmth(0.0f);
38
39            System.out.println("4:");
40            x.dosmth(null);
41            z.dosmth(null);
42        }
43    }
```

4. There are compilation errors in 5 lines in the following code. Provide numbers of these lines with a description of corresponding errors as an answer.

```java
1    interface Q {
2        private void setQ();
3        protected Q();
4        public abstract int Q();
5    }
6
7    public final class P extends Q {
8        int x = x;
9        int [] y;
10       int z [];
11
12       int dosmth() [] {
13           return z + y;
14       }
15   }
```

5. Describe the *Adapter* pattern. Why and when is it used? What examples of Adapter do you know within Java API?

6. Describe the concept of *Continuous Integration*.

7. Describe the *generational garbage collector*.

8. Describe the Reflection API. What and when is it used for?