CPSC 233 Midterm, Winter 2003

DEPARTMENT OF COMPUTER SCIENCE
THE UNIVERSITY OF CALGARY
Time: 50 minutes
50 marks total
L04

This is a closed book exam.
No calculators or other computational devices are allowed.
Put all your answers in this exam.
Unless otherwise indicated assume that all programs and code fragments *will* compile.

First name _____ Last name _____ ID _____

Section	Your score	Max score
Miscellaneous		20
Reading code		15
Writing code		15
TOTAL		50

Section I, Miscellaneous: *20 marks*

1. True/False questions: circle the correct choice. (1 *mark for each sub-question x 2 sub-questions = 2 marks total*)

   a. Arrays in Java are always dynamically allocated (True / False):
   b. Array indices in Java must always be integers (True / False):

2. Circle the correct choice (*1 mark*)

The (private / public) data fields of an object can only be accessed or modified within the methods of that object.

3. Fill in the blanks (*6 marks*)

The _____ operation allows you look at the element at the top of a stack without removing the element, whereas the _____ operation actually removes the element from the stack. You would add an element to the top of the stack with the _____operation.

Questions 4 & 5 Multiple choice:

For the following two questions, please refer to the statements below:

```
String s1;                          // First statement
s1 = new String (“233 Rocks!”);     // Second statement
```

4. Which of the following is true about the first statement? (*2 marks*)
   a. It is a declaration of a reference to an object of type String.
   b. It is a declaration of class String
   c. It allocated memory for an instance of type String and this memory is called/labeled "s1".
   d. It dynamically allocated memory for an instance of type String with the address of the dynamic memory being stored in the reference called/labeled "s1".
   e. None of the above are true.

5. Which of the following is true about the second statement? (*2 marks*)
   a. It is a declaration of a reference to an object of type String.
   b. It is a declaration of class String
   c. It allocated memory for an instance of type String and this memory is called/labeled "s1".
   d. It dynamically allocated memory for an instance of type String with the address of the dynamic memory being stored in the reference called/labeled "s1".
   e. None of the above are true.

Questions 6, 7 & 8 Short answer:

6. When is the constructor for a class called? (2 *marks*)

7. What are the components of the signature of a method? (*3 marks*)

8. Describe what is meant by "message passing". (*2 marks*)

Section II, Reading code (What does this do?): *15 marks*

1. In the space provided on the next page list the output of the following program. (*10 marks*)

```
class Person
{
    private String name;
    private int age;

    public Person ()
    {
        name = "Nameless";
        age = 0;
    }

    public Person (String s, int i)
    {
        name = s;
        age = i;
    }
    public String getName () { return name; }
    public void setName (String newName) { name = newName; }
    public int getAge () { return age; }
    public void setAge (int newAge) { age = newAge; }
}

class Driver
{
    public static void methodOne (Person p)
    {
        Person temp = new Person ("Jim Tam (Ace Consultant)", 24);
        p = temp;
        System.out.println("m1: " + p.getName() + " " + p.getAge());
    }

    public static void methodTwo (Person p)
    {
        p.setName("Jim Tam (Ace Gameshow host)");
        p.setAge(27);
        System.out.println("m2: " + p.getName() + " " + p.getAge());
    }

    public static void main (String [] argv)
    {
        Person p = new Person ();
        System.out.println("Main: " + p.getName() + " " + p.getAge());
        methodOne (p);
        System.out.println("Main: " + p.getName() + " " + p.getAge());
        methodTwo (p);
        System.out.println("Main: " + p.getName() + " " + p.getAge());
    }
}
```

(Put your answer on the next page)

<< Put your answer here >>

2. In the space provided below list the output of the following program. (*5 marks*)

```
public class Uhoh
{
    static void not(int o)
    {
        System.out.print("Rats ");
    }
    static int again(int ack)
    {
        System.out.print("Big ");
        if (ack > 0)
            Uhoh.not(again(ack-1));
        return ack;
    }
    public static void main(String[] args)
    {
        int ack = 4;
        again(ack);
        System.out.print("Rats");
    }
}
```

<< Put your answer here >>

Section III, Writing code: *15 marks*

1. For this question, please refer to the following definitions for class Walker and class LOTR. (*10 marks*)

In the space provided below, in the main method of class LOTR, write the code to do the following:

- Set the name field of w1 to “Legolas”
- Set the race field of w1 to “Wood Elf”
- Display the NEMESIS field on a line by itself
- Display the name field on a line by itself
- Display the race field on a line by itself

```
class Walker
{
    private String name;
    private String race;
    public static final String NEMESIS = "Sauron";
    public Walker ()
    {
        name = "";
        race = "";
    }
    public String getName () { return name; }
    public void setName (String n) {name = n; }
    public String getRace () {return race; }
    public void setRace (String r) {race = r;}
}
class LOTR
{
    public static void main (String [] argv)
    {
        Walker w1 = new Walker ();
        << Put your answer here >>









    }
}
```

2. In the space provided below write a toString () method for class ManyFields. (*5 marks*)

```
class ManyFields
{
    private String str;
    private int num;
    private boolean bool;

    public ManyFields ()
    {
        str = "Foo good times and foo bad";
        num = 34;
        bool = true;
    }
    public ManyFields (String s)
    {
        str = s;
    }
    public ManyFields (int n)
    {
        num = n;
    }
    public ManyFields (boolean b)
    {
        bool = b;
    }
```

<< Put your answer here >>

```
}
```

JT: Time to relax, you made it through the exam!