

CPSC 100 Winter 2008
Midterm II—12 March 2008

Name(Printed) : _____

Signature : _____

Student Number :

--	--	--	--	--	--	--	--

BETA	KILN	POET
BIRD	KITE	RAFT
BLOT	MANX	REED
BOOK	MESH	RING
BREW	MINK	RUBY
CAMP	MOTH	RUFF
INCH	MOVE	SEAM
IRIS	MUSK	SEED
ISLE	PARK	SHOP
KERN	PINE	SILK

Question	Score
1	/2
2	/3
3	/3
4	/3
5	/5
6	/5
7	/6
8	/6
9	/5
10	/8
11	/4
Total	/50

- Write the word indicated above on each page of your exam in the box labelled “Identifier” on the following pages of the examination. Examination papers sometimes come unstapled. Failure to put the circled word on a page of your exam may result in no marks being awarded for that page.
 - *Read each question carefully. Ask yourself what the point of the question is. Check to make sure that you have answered the question asked.*
 - This is a 50 minute exam. This exam contains 8 pages of questions not including this cover page. Make sure that you have all of them.
 - Answer all questions on the exam sheet. If you do some of your work on the back of a page, clearly indicate to the marker what work corresponds with which question.
 - Partial marks shall be awarded for clearly identified work.
 - This exam counts as 20% of your total grade. There are 50 points maximum on this exam.
-

Shorter Questions

- (2) 1. The statements `x++` and `++x` have the same _____ but different _____.
- (3) 2. What happens when an object is constructed?
- (3) 3. What does the word `static` do/mean?
- (3) 4. Explain why the fields of a class are usually `private`, whereas the methods are `public`.

```
public class Scope                                     1
{                                                       2
    public Scope()                                     3
    {                                                       4
        java.util.Scanner s = new java.util.Scanner(System.in) ; 5
        i = 200 ;                                       6
        int j = 200 ;                                   7
        for (int k=j/i ; k>0 ; --k)                   8
        {                                                       9
            System.out.println("k = " + k) ;          10
        }                                               11
        System.out.println("") ;                       12
    }                                                   13

    private int i ;                                     14
}                                                       15

```

Figure 1: Code for question 5

- (2) 5. (a) Explain what the *scope* of a variable is.
- (3) (b) Draw a box showing the scope of *i*, the scope of *j*, and the scope of *k* in the code shown in Figure 1. Clearly indicate which box belongs with which variable.

True or False

1 each

6. Circle **TRUE** or **FALSE** as appropriate. Questions that look as if they indicate *two* choices shall be marked wrong.
- (a) A switch statement without a default label is illegal. **TRUE FALSE**
- (b) If a switch statement without a default label is called and no case: matches, a run-time error occurs. **TRUE FALSE**

- (c) Method names cannot be used more than once per class.
TRUE FALSE
- (d) Constructors can have an arbitrary number of arguments.
TRUE FALSE
- (e) When executing a do-while statement, the body is executed at least once.
TRUE FALSE

Short Examples

7. For each of the following questions write a very short code example consisting of a few lines of code. *It is not necessary to write a complete function or program!*

- (2) (a) Show how to create a variable called `infile` that to be passed to a Scanner to read values from the file "text.txt".
- (2) (b) Show how to create a variable called `outfile` that can be used for writing values to the file "text.txt".
- (2) (c) Write a do-while loop that prints out " 1 2 3 4 5 6" (here " " is a space).

Programming

- (6) 8. Write a `Circle` class that has the following methods: `setRadius`, `getRadius`, `getArea`, and whatever else you need. (The area of a circle of radius r is πr^2 . The value π is called `Math.PI`.)

- (5) 9. Rewrite the code in Figure 2 on page 8 to use a switch statement with four cases and a default.

Meaning

10. Show what output is produced by each of the following programs or segments of programs. (You may assume that the code compiles.) Explain briefly:

(3)

(a)

```
public class Main
{
    public static void main(String [] args)
    {
        int x=2 ;
        int y=5 ;
        if ((x++ > 0) || (--y < 4))
        {
            System.out.println(y) ;
        }
        else
        {
            System.out.println(x) ;
        }
        return ;
    }
}
```

(2)

(b)

```
public class Main
{
    public static void main(String [] args) {
        int i=5 ;
        do {
            System.out.println(i) ;
            i = i + 1 ;
        } while (i<5) ;
        return ;
    }
}
```

(3)

(c)

```
import java.util.DecimalFormat ;
public class Main
{
    public final int N = 9 ;

    public static void main(String [] args) {
        for(int i=N;i>=1;--i)
            {
                for(int j=1;j<=i;++j)
                    {
                        System.out.print("*") ;
                    }
                System.out.println("") ;
            }
        return 0 ;
    }
}
```

Bug hunting

2 each

11. Each of the following pieces of code contains at least one mistake that makes it clearly wrong. In some cases the mistake would show up at compile-time; in other cases the mistake shows up at run-time. In each case, circle the code that is clearly wrong. Explain what is wrong, and how to correct it.

(a)

```
for(int i=0;++i;i<10)
{
    System.out.println(i);
}
```

(b)

```
while(i<10) ;
{
    System.out.println(i);
    ++i ;
}
```

```
public static String strangePhysics (int q)
{
    String answer ;
    if (q<1 || q>=5)
    {
        answer = "outside" ;
    }
    else
    {
        if (q>=3)
        {
            if (q%2==1)
            {
                answer = "charm" ;
            }
            else
            {
                answer = "beauty" ;
            }
        }
        else
        {
            if (q==2)
                answer = "up" ;
            else
                answer = "left";
        }
    }
    return answer ;
}
```

Figure 2: Code for question 9 on page 5