Family Name: . . . .   Other Names: . . . .

ID Number: . . . .

COMP102: Test 1

25 July, 2008

Instructions

- Time allowed: **45 minutes** .
- Answer **all** the questions. There are 45 marks in total.
- Write your answers in the boxes in this test paper and hand in all sheets.
- If you think some question is unclear, ask for clarification.
- The last page contains some Java documentation and model solutions for part of Assignment 2.
- This test will contribute 4% of your final grade, but only if it helps your grade.
- Paper translation dictionaries and calculators without a full set of alphabet keys are permitted.

Questions	Marks	
1. Basic Java	[9]	
2. Understanding variables	[3]	
3. Input/Output: using a Scanner and printf	[8]	
4. Graphical output	[15]	
5. "If" statement	[10]	
	TOTAL:	

Please answer the following question. (Your answer will not affect your mark in any way.)

How much programming had you done before starting the course?

☐ Little or none

☐ Some (used variables, if's, and loops)

☐ Lots (used arrays, defined methods/functions with parameters, used libraries)

SPARE PAGE FOR EXTRA ANSWERS

Cross out rough working that you do not want marked.
Specify the question number for work that you do want marked.

Question 1. Basic Java [9 marks]

For each of the following ten terms, find a corresponding element of the program below, draw a box around the element and label it with its number. The first one is done as an example.

1. Class name
2. A string
3. A variable
4. An expression with an operator
5. A comment
6. The name of a method
7. The name of a type
8. An assignment statement
9. A method call
10. A parameter declaration

```java
public class Converter{     // [1]

   // Formula for converting between miles per hour and meters per second

   public void printFormula(){

      System.out.println("mph = m/s / 0.44704");

      System.out.println("m/s = mph * 0.44704");
   }

   /** Convert from mph to m/s */

   public void milesPerHrToMetersPerSec(double mph){

      double mps = (mph * 0.44704 );

      System.out.println(mph + "mph = " + mps + "m/s");
   }

   /** Convert  from m/s to  mph */

   public void metersPerSecToMilesPerHr(double mps){

      double mph = (mps / 0.44704);

      System.out.println(mps + "m/s = " + mph + "mph");
   }
}
```

Question 2. Understanding variables [3 marks]

Suppose the following compute method is called with an argument of 10 (eg, you call the method using BlueJ and enter 10 in the dialog box asking for the value of num). What will it print out?

```java
public void compute(int num){

    int a = num + 2;
    int b = num + a;
    System.out.println("num is " + num);
    System.out.println("a is: " + a);
    System.out.println("b is: " + b);

    a = a * 2;
    b = a * 2;
    b = b + 1;

    System.out.println("a is now: " + a);
    System.out.println("b is now: " + b);

    System.out.printf("a: %d, b: %d, num: done. \n", num, a+b);
}
```

```
num is
```

Question 3. Input/Output: using a Scanner and printf [8 marks]

Complete the following method to print out a payslip. The method should first ask the user to enter a name and the number of hours worked. Then it should calculate the payment using a $17.5 hourly rate and print out a payslip like the one shown below. It should use a Scanner to read the name and the hours worked from the user.

For example, if the user typed Sharon for the name, and 10 for the number of hours worked, the output should look something like:

```
Sharon is paid $175.00.
```

```
public void payslip(){




































}
```
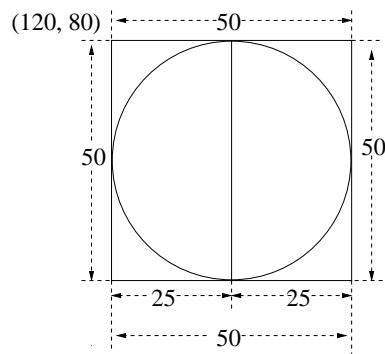
Question 4. Graphical output

[15 marks]

(a) [8 marks] Complete the following method to draw a picture with a square, a circle inside the square, and a line in the middle of the circle. The dimensions are shown below. The top left corner of the picture should be at (120, 80).

Please note that you don't need to draw any numbers or the dotted lines.


```
public void drawPictures(){
    // make the window
    JFrame frame = new JFrame("Shapes");
    frame.setSize(700, 400);

    // make the canvas for drawing in, and add it to the window.
    DrawingCanvas canvas = new DrawingCanvas();
    frame.getContentPane().add(canvas, BorderLayout.CENTER);
    frame.setVisible(true);




}
```

(b) [7 marks] Modify your previous method so that the location and the size of the picture can be changed. For example, the coordinates of the top left corner of the picture can be any specified integers instead of just (120, 80) and the diameter of the circle (or the width of the square) can be any specified integer instead of 50 only.

You should use parameters to specify the location and the size.

```java
public void drawPictures(int x,  int y,  int size){
    // make the window
    JFrame frame = new JFrame("Shapes");
    frame.setSize(700, 400);

    // make the canvas for drawing in, and add it to the window.
    DrawingCanvas canvas = new DrawingCanvas();
    frame.getContentPane().add(canvas, BorderLayout.CENTER);
    frame.setVisible(true);




    }
```

Question 5. "if" statement [10 marks]

(a) [3 marks] What will the following method print out if it is called with the arguments 4 and 7?

```java
public void twoNumbers(int a, int b){
      System.out.printf("Two Numbers: %d, %d\n", a, b);
      int ans = 1;
      if (a >= b){
            a = a-b;
            b = b+1;
      }
        else {
            int temp = a;
            a = b;
            b = temp;
            ans = ans + a;
      }
      System.out.printf("a: %d, b: %d, ans = %d\n", a, b, ans);
   }
```

```
Two Numbers:  4, 7


```

(Question 5 continued)

(b) [7 marks] Suppose we want to calculate the grade based on the term test mark as shown below:

    75 – 100: A
    60 – 74: B
    50 – 59: C
    40 – 49: D
    0 – 39: E

Your method has a parameter to specify the mark and you may assume that we only allow integer marks. Your method should print out the grade that it computes in a form such as:

    Term test mark: 64

    Grade: B

(where the actual mark depend on the argument value passed to the method.)

```java
public void computeGrade(int mark){



    }
```

SPARE PAGE FOR EXTRA ANSWERS

Cross out rough working that you do not want marked.
Specify the question number for work that you do want marked.

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