

Name:

ID Number:

COMP102: Test 1

26 July, 2006

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.
- There is some Java documentation at the end of the test paper.
- Model solutions for part of Assignment 2 are also included at the end of the test paper.
- This test will contribute 5% of your final grade, but only if it helps your grade.
- Non-electronic translation dictionaries and calculators without a full set of alphabet keys are permitted.

Questions

Marks

1. Basic Java

[22]

2. Loops with Numbers

[20]

3. Loops with Files

[8]

4. Objects with Arrays of Objects

[21]

5. Debugging Loops

[14]

TOTAL:

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

[13 marks]

(a) [8 marks] For each of the following nine terms, find a corresponding element of the program below, and draw a labelled circle around the element. The first one is done as an example.

1. Class name
2. Method definition
3. Assignment statement
4. Method call
5. Parameter declaration
6. Variable declaration
7. Type
8. Expression
9. String

```
public class Question1 {  
  
    public void doQn(int n) {  
  
        double a = 20.0;  
  
        double b = n;  
  
        a = b;  
  
        b = (a + 15) / 5;  
  
        System.out.println("n is now " + n);  
  
        System.out.printf("first is now %.2f second is now %.2f\n", a, b);  
  
    }  
}
```

(b) [5 marks] Suppose the doQn method above 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 n). What will it print out?

Question 3. Using a Scanner

[15 marks]

(a) [6 marks] The following method will prompt the user for some values. What will the method print out if the user types the following line

```
3 6 2006 14 Wellington Jane
```

in response to the first prompt

```
public void doit(){
    Scanner scan = new Scanner(System.in);
    System.out.print("Enter values: ");
    int n = scan.nextInt();
    n = n + scan.nextInt();

    System.out.println("answer1 = " + n);

    String y = scan.next();
    int w = scan.nextInt();
    y = y + w;
    System.out.println("answer2 = " + y);

    String name = scan.next();
    String city = scan.next();
    System.out.println(name + " commutes to " + city);
}
```

```
Enter values: 3 6 2006 14 Wellington Jane
```

```
()
```

(Question 3 continued on next page)

(Question 3 continued)

(b) [9 marks] Complete the following `printTag` method so that it asks the user to enter their name and then prints out a name tag like the one shown below. It should use a `Scanner` to read the name from the user.

If the user typed the name "Peter Smith", the nametag should look something like:

```
+-----+
| HELLO,   My name is   |
|                                     |
|     Peter Smith      |
|                                     |
+-----+
```

```
public void printTag(){
```

```
}
```

Question 4. Loops and Conditionals (harder)

[7 marks]

(a) [5 marks] What will the following doNums method print out if it is called with the arguments 23 and 7?

```
public void doNums(int n, int m){
    System.out.println("doNums : ");
    int x = n;
    int y = m;
    int z = 0;
    while (x > 0){
        if (x % 2 == 1){
            System.out.println(y);
            z = z + y;
            x = x - 1;
        }
        else if (x % 2 == 0) {
            x = x / 2;
            y = y + y;
        }
    }
    System.out.printf("%d, %d => %d", n, m, z);
}
```

doNums :

(b) [2 marks] Explain what the method computes and how.

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.

Brief and partial documentation of some classes and methods

```
PrintStream class: // eg System.out
public void print ( String s); // Prints s with no newline
public void print ( int i); // Prints i with no newline
public void print ( double d); // Prints d with no newline
public void println (); // Prints a newline
public void println ( String s); // Prints s followed by newline
public void println ( int i); // Prints i followed by newline
public void println ( double d); // Prints d followed by newline
public void printf ( String format, ...); // Prints the format string , inserting the remaining
// arguments at the %'s in the format string :
// %s for Strings
// %10s for Strings , using at least 10 characters
// %d for ints
// %3d for ints , using at least 3 characters
// %.2f for doubles , with 2dp
// %6.2f for doubles , with 2dp and at least 6 characters )
// \n for newline
```

```
Scanner class:
public Scanner(InputStream i); // Constructor . eg new Scanner ( System.in )
public boolean hasNext(); // Returns true if there is more to read
public boolean hasNextInt(); // Returns true if the next token is an integer
public boolean hasNextDouble(); // Returns true if the next token is a number
public String next (); // Returns the next token ( chars up to a space / line )
public String nextLine (); // Returns the rest of the current line
public int nextInt (); // Returns the integer value of the next token
// ( throws exception if next token is not an integer )
public double nextDouble(); // Returns the double value of the next token
// ( throws exception if next token is not a number )
public void close (); // Closes the file ( if it is wrapping a File object )
```

```
DrawingCanvas class:
public void clear (); // Clears the drawing canvas
public void setForeground(Color c); // Change the colour for later commands
public void drawLine(int x, int y, int u, int v); // Draws line from cd{(x, y) to cd{(u, v)
public void drawRect(int x, int y, int wd, int ht); // Draws outline of rectangle
public void fillRect ( int x, int y, int wd, int ht); // Draws solid rectangle
public void clearRect(int x, int y, int wd, int ht); // Draws clear rectangle
public void drawOval(int x, int y, int wd, int ht); // Draws outline of oval
public void fillOval ( int x, int y, int wd, int ht); // Draws solid oval
```
