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

ID Number: . . . .

COMP102: Test 1

16 Mar, 2007

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   [8]

2. Understanding variables   [5]

3. Defining a Method   [10]

4. Using a Scanner and println   [15]

5. Loops and Conditionals   [7]

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 [8 marks]

For each of the following ten 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 header
3. Assignment statement
4. Method call
5. Parameter declaration
6. Variable declaration
7. Name of a type
8. An expression
9. A call to a constructor
10. A String

```java
public class Question1{

    public void translate (){

        Scanner scan = new Scanner(System.in);

        System.out.print("word: ");

        String word = scan.next();

        System.out.println("I don't understand "+ word);

    }

    public void expand(int n){

        double larger = (n * n * n) + 100;

        System.out.printf("%.2f expanded is %.2f\n", n, larger);

    }
}
```

Question 2. Understanding variables [5 marks]

Suppose the following calculate method is called with an argument of 20, (eg, you call the method using BlueJ and enter 20 in the dialog box asking for the value of num). What will it print out?

```java
public void calculate( int  num){
    int   first  = num;
    int  second = first  + num;

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

     first  =  first  / 7;
    num = num + 1;
    second = second + num;

    System.out.println("num is now "+ num);
    System.out.printf("a: %d b: %d\n", first,  second);
}
```

num is now:

Question 3. Defining a Method [10 marks]

Complete the following computeBuses method so that it prints out the number of minibuses a school needs to take some of its sports teams to the regional competition. The method should have one parameter — an integer specifying the number of teams the school is going to take.

Each team has 11 players and one coach. The school also needs to have an extra adult helper for each minibus. A minibus can take 18 passengers.

The method should print out the result in a form such as:

```
For 8 teams, you need 6 minibuses
```

```
public void computeBuses(



















}
```

Question 4. Using a Scanner and println [15 marks]

(a) [6 marks] Consider the following method which will prompt the user for some values and print something out.

```java
public void doit (){
    Scanner scan = new Scanner(System.in);
    System.out.print("Enter name, phone, address: ");
    String m = scan.next();
    String n = scan.next();
    String n = n + m;

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


    int p = scan.nextInt ();
    int q = scan.nextInt ();
    int r = scan.nextInt ();
    System.out.println("answer2 = " + p + q + r);
    System.out.println("answer3 = " + (p + q + r));

    int s = scan.nextInt ();
    String t = scan.nextLine();

    System.out.println("number " + t + " on " + s + "Street");
}
```

What will the method print out if the user typed the following lines in response to the prompt:

```
Lindsay Smith
020 123 2004
28 Short St
```

()

(Question 4 continued)

(b) [9 marks] Complete the following printGreeting method so that it first asks the user to enter a number and then asks the user to enter a name, and then prints out a birthday card greeting like one shown below. It should use a Scanner to read the number and name from the user.

If the user typed the number 19 and the name "Jean", the output should look something like:

```
Dear Jean
   Happy 19th birthday!
   Many happy returns.
```

```
public void printGreeting(){




















}
```

Question 5. Loops and Conditionals (harder) [7 marks]

(a) [5 marks] What will the following method print out if it is called with the arguments 28 and 20?

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

```
doNums(28, 20)




















```

(b) [2 marks] Explain what the doNums 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*