

Please fill in your Student Number and Name.

Student Number : _____

Name:

Student Number:

University of Cape Town ~ Department of Computer Science
Computer Science 1015F ~ 2009
Supplementary Test 1

Question	Max	Mark	Internal	External
1	10			
2	10			
3	10			
TOTAL	30			

Marks : 30
Time : 40 minutes
Instructions:

- a) Answer all questions.
- b) Write your answers in the space provided.
- c) Show all calculations where applicable.

Question 1 [10]

a) In computer hardware, what is a multicore CPU? [1]

b) What is the purpose of the memory in a typical Von Neumann architecture? [1]

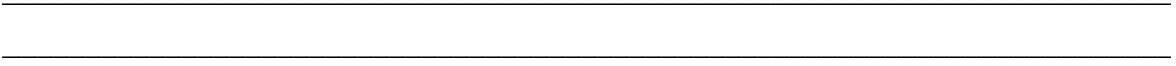
c) What is a variable? [1]

d) What is an algorithm? [1]

e) Why are modern computer programs not usually written in low level languages? [1]

f) Give 3 examples of low level programming languages. [2]

g) Describe the steps in the process of compiling and executing a Java program. [3]



Question 2 [10]

Consider the following program and answer the questions that follow.

```
import java.util.Scanner;

class test
{
    public static void main ( String [] args )
    {
        Scanner input = new Scanner (System.in);

        int a = input.nextInt();
        int b = input.nextInt();

        if (a / b == b / a)
            System.out.println ("yes");
        else
            System.out.println ("no");
    }
}
```

a) What is the output of this program if the input is the numbers 3 and 7? [1]

b) Give an example of the name of a variable, from the program. [1]

c) What real-world hardware does the **input** object correspond to? [1]

d) What is the purpose of the **nextInt** method? [1]

e) For what values of **a** and **b** will the program not work? [1]

f) In the if statement above, if the “==” symbol was converted to “!=”, what changes would be needed to maintain the meaning of the program? [1]

g) What is the dangling else problem? [2]

h) Comments are missing in this program. Write out typical comments to be inserted at the top of the program. [2]

Question 3 [10]

- a) Briefly describe an algorithm to find the maximum of a set of 5 integers. You may write a textual description of the solution or a fragment of a program. Assume the numbers have been input already and are stored as variables a, b, c, d and e. [3]

- b) Write the Java statement to input the first integer into the variable **a**. You may assume **a** is already declared as an int and there is already a Scanner object named **input**. [1]

- c) Write the Java statement to calculate **maximum** as the maximum of the 2 floating point values **a** and **b**. You may assume **a**, **b** and **maximum** are already declared as float variables. [2]

- d) Write the Java statement to output “The maximum is ” followed by the value of the variable **maximum**. [2]

- e) Is your algorithm the most efficient solution? Explain why or why not. [2]
