IB Diploma Computer Science

Unit 4.3 Programming - Sample test Total: 35 marks

Q1.

Write an algorithm to input 1000 numbers. Count how many numbers are positive and how many numbers are zero. Then output the results. [6 marks]

Q2.

A Java program is used to record a shopping list in an array of 100 items called `shopping`:

(a) Write the line of Java that will define the array described. [2 marks]

(b) Write an algorithm that prompts a user to enter items for the shopping list, saving it into the array variable by continually asking for a new item to be added. The program should finish asking for input when an empty string is entered, or when the array is full. [7 marks]

(c) Write a function called `printList` that receives the shopping list as a parameter, and prints each item in the array as output. [5 marks]

Q3.

The following program is used to calculate the average of a list of numbers.

```
int[] items = { 32, 27, 60, 49, 92 };
int total = 0;
for (int n : items) {
    total = total + n;
}
double average = total / items.length;
System.out.println(average);
```

(a) What data type is `items`? [1 mark]

(b) What data type is `items[0]`? [1 mark]

(c) What data type is `average`? In what way is it different to the data type in (b)? [2 marks]

(d) How would the printed output be different if `average` was calculated using `int average = total / items.length;` instead? [1 mark]

Q4.

Rewrite the program from question 3 so that in addition to its existing functionality, it also calculates the range for any given set of `items` (range is defined as the numerical difference between the highest and lowest values). [6 marks]

Q5.

Given the following example variable

```
String address = “3 Lai Wo Lane, Fo Tan, Sha Tin, Hong Kong”;
```

Write programming code that would split the data based on the presence of the comma to generate the following example printed output

```
3 Lai Wo Lane
Fo Tan
Sha Tin
Hong Kong
```

[4 marks]