Birkbeck

(University of London)

BSc/FD MOCK EXAMINATION

Department of Computer Science and Information Systems

Introduction to Programming (BUCI007H4)

CREDIT VALUE: NONE

Date of examination: Tuesday 3rd December 2019
Duration of paper: 1 hour and 20 minutes

The programming language is PYTHON.

Write your name at the top of this question paper.

There are in total **seven** questions in this paper.

Answer all **seven** questions using the spaces provided.

Each question carries **10** marks in total.

Calculators and other electronic devices are not permitted.

The examination is closed book.

No supplementary material is provided.

This paper is not prior disclosed.

The quote marks for strings are in this style ″string″.

1. (a) Which of the following are accepted by the compiler as names of variables and which are not accepted?

   i) x

   ii) 5x

   iii) x5

   iv) "variable"

   v) "VARIABLE"

   (**5** marks)

   (b) Consider the following code.

   ```
   a = 5
   b = 3
   c = a+b/2
   d = a+b//2
   ```

   What are the values of c and d? (**5** marks)

2. (a) State one advantage in using pseudo code to design an algorithm. (**4** marks)

(b) A program contains a variable n equal to the number of litres of petrol in the fuel tank of a car and a variable fe equal to the fuel efficiency of the car in miles per litre. Let d be the distance in miles that the car can go with the petrol in the tank. Show how d can be calculated from n and fe. (**3** marks)

(c) Let price be the price of petrol in pounds per litre and let c be the cost in pounds of 100 miles of travel. Show how c can be calculated from price and fe. (**3** marks)

3. Find five errors in the following code.

```
print("balance", balance)
balance = 10,000        # pounds sterling
rate% = 5               # per cent
interest = balance*rate%/100
newBalance = balance+interest
print(The new balance is ", newBalence)
```

(**10** marks)

4. (a) Evaluate the following expressions.
   i) "Hello"[0]

   ii) "Hello"*3

   iii) len("Hello")

   iv) len("A\"H")

   v) str(5)

(**5** marks)

(b) The following statement is used to read in from the keyboard the number of cans in a pack of cans.

```
numberCans = int(input("Enter the number of cans per pack: "))
```

Explain why the function int is required on the right hand side of the above statement.

(**5** marks)

5. (a) Consider the following statements.

```
price = 23.161
print(price)
print("%.2f" % price)
```

Describe the print out when the above statements are executed. (**5** marks)

(b) It is required to print a list of integers. Each integer is non-negative and strictly less than 1000. What is the minimum width of field that should be used for printing out the integers? Justify your answer. (**3** marks)

(c) Consider the following two print statements.

```
print("first: %3d" % 5)
print("second: %3d" % 7)
```

Show how one of the format specifiers can be edited to ensure that the two numbers 5 and 7 in the print out are aligned vertically. (**2** marks)

6. (a) Evaluate the following expressions.

    i) $4 > 3$

    ii) $0 < 200$ and $200 < 100$

    iii) $0 < 200$ or $200 < 100$

    iv) $"string" == "string"$

    v) $False == True$

(**5** marks)

(b) Let x and y be two variables with values of type int. Write out a Boolean expression that has the value True if and only if at least one of x and y is zero.   (**5** marks)

7. The following code assigns a value "A", "B" or "C" to the variable grade. This assignment depends on the variable mark to which a suitable value has already been assigned.

```
grade = "C"
if mark >= 70 :
    grade = "A"
if mark >= 50 :
    grade = "B"
```

(a) Describe the error in the above code. (**4** marks)

(b) Write out a correct version of the above code using the if. . . elif. . . else construction for nested if statements. The assignment grade = "C" must be placed within the nested if statements. (**6** marks)