Name: Class:

**Task 1**

The flowchart depicts an algorithm for computing the monthly bill for calls on a mobile phone.

MonthlyTariff ← 23.00

TotalCharge ← MonthlyTariff

 ExtraCharge ← ExtraMinutes \*

PerMinuteRate

Start

End

INPUT MinsUsed

IS MinsUsed > 600?

Yes

No

OUTPUT TotalCharge

ExtraMinutes ← MinsUsed - 600

TotalCharge ← TotalCharge + ExtraCharge

(a) Explain how the total monthly charge is calculated.

(b) Complete the table below to:

* State whether the identifier is a variable or constant
* State the data type that would be required
* Give a typical value for each identifier

|  |  |  |
| --- | --- | --- |
| **Identifier** | **Variable or constant?** | **Data type****Typical value** |
| MonthlyTariff |  |  |
| TotalCharge |  |  |
| MinutesUsed |  |  |
| ExtraMinutes |  |  |
| PerMinuteRate |  |  |
| ExtraCharge |  |  |

(c) Assume the basic monthly tariff is £23.00 per month, and that extra minutes are charged at 2p per minute. A customer makes calls totalling 700 minutes on their phone. What is their total change that month?

Task 2

What is output by the following algorithm if the user enters 3, 8 and 10?

OUTPUT "Please enter values for a, b and c"

INPUT a

INPUT b

INPUT c

x ← a \* b + c

y ← (b + c) / a

z ← x DIV y

w ← x MOD y

x ← x + y

OUTPUT x

OUTPUT y

OUTPUT z

OUTPUT w

Task 3

1. Write pseudocode for an algorithm which allows the user to enter their first name and surname. The algorithm will then output their name in the format “initial surname”.

 e.g. Input 1: “Jim”, Input 2: “Daley”, Output: “J Daley”

 The algorithm will also need to have the initial and first letter of the surname as capital letters. All other letters of the surname will need to be lowercase.

 e.g. Input 1: “george”, Input 2: “garlAnd”, Output: “G Garland”

 Assume the string in indexed from 0, so the first character in the string will be referred to as stringName[0].

 Make use of concatenation and the following functions:

 LENGTH(s) finds the length of s
UCASE(s) gives the uppercase of s
LCASE(s) gives the lowercase of s
SUBSTRING(str,start,length) gives a substring from start that is length long

|  |
| --- |
|  |

2. Comments are used in programs to give information about algorithms used, the author of a program or how complex parts of a program work.

 Generally, not every line of a program is commented, however, for this exercise, write a comment after each line of code to explain what it does.

CONSTANT Pi ← 3.14

OUTPUT "Enter radius: "

INPUT Radius

Area ← Pi \* Radius \* Radius

OUTPUT Area