MODULE M PROGRAMMING · M1

Variables, constants, input and output

Original practice questions · 22 marks · ~25 minutes · Cambridge 0478 syllabus 8.1.1, 8.1.3, 8.1.4(a)

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. The total for this worksheet is **22 marks**. Pseudocode on this sheet follows the Cambridge 0478 pseudocode guide.

1

Total: 3 marks

Complete the table by writing the correct term for each description. Choose each term from this list. Not all the terms are used. **[3]**

Constant | Input | Output | Sequence | Variable

Description	Term
A named value that is set once and cannot change while the program is running	
Statements are carried out one after another, in the order they are written	
A named memory location that stores a value that can change while the program is running	

2 **Total: 5 marks**

A river boat company uses this algorithm to work out the cost of adult tickets for a trip.

```
01 CONSTANT TicketPrice ← 7.50
02 DECLARE Adults : INTEGER
03 DECLARE TotalCost : REAL
04 OUTPUT "How many adult tickets?"
05 INPUT Adults
06 TotalCost ← Adults * TicketPrice
07 OUTPUT "Total to pay: ", TotalCost
```

(a) State the identifier of the constant in the algorithm. **[1]**

(b) Give the identifier of **one** variable in the algorithm. **[1]**

(c) The input is 4. Write down the output from line 07. **[1]**

(d) Give **two** reasons why the programmer used a constant for the ticket price instead of writing 7.50 in line 06. **[2]**

1

2

3 **Total: 5 marks**

Look at this algorithm.

```
01 DECLARE Points : INTEGER
02 DECLARE Bonus : INTEGER
03 Points ← 3
04 INPUT Bonus
05 Points ← Points + Bonus
06 Bonus ← Points * 2
07 Points ← 1
08 OUTPUT Points, " and ", Bonus
```

(a) Complete the trace table for the algorithm using the input data: `6` **[3]**

Points	Bonus	OUTPUT

(b) `Points` stores 9 after line 05. Explain why the output does **not** show the value 9 for `Points`. **[2]**

4 **Total: 4 marks**

A storage shelf holds up to 60 boxes. This algorithm should ask a worker for the number of boxes on the shelf, store the number of free spaces in `FreeSpace`, and then output it with a message.

```
01 CONSTANT ShelfLimit ← 60
02 DECLARE Stored : INTEGER
03 DECLARE FreeSpace : INTEGER
04 OUTPUT "Enter the number of boxes on the shelf"
05 INPUT "Enter the number of boxes on the shelf", Stored
06 ShelfLimit ← ShelfLimit - Stored
07 OUTPUT "Free spaces: ", FreeSpace
```

Identify the line numbers of the **two** errors in the algorithm and suggest a correction for each error. **[4]**

Line number	Correction

5 **Total: 5 marks**

A garden centre sells compost at a fixed price of 4.25 for each bag.

Write an algorithm using pseudocode that: **[5]**

- uses a constant for the price of one bag, 4.25
- declares the variables that are needed
- asks the user to input the number of bags wanted and stores it
- calculates the total cost
- outputs the total cost with a suitable message.

Total for this worksheet: 22 marks