MODULE K ALGORITHM DESIGN · K9

Finding and fixing errors in an algorithm

Original practice questions · 21 marks · ~25 minutes · OCR J277 specification 2.1.2 (with 2.3.2)

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. Where you write a corrected line of code, you may use OCR Exam Reference Language or a high-level programming language that you have studied. The total for this worksheet is **21 marks**.

1

Total: 3 marks

A programmer has written three lines of code. Each line contains **one** error.

(a) Tick (✓) **one** box in each row to show whether the error is a syntax error or a logic error. **[3]**

What the line should do	Line of code	Syntax error	Logic error
Output the message Goodbye	`print("Goodbye)`		
Repeat the code inside the loop 10 times	`for i = 1 to 9`		
Check whether the door code entered is 4821	`iff code == "4821" then`		

2

Total: 4 marks

A garden centre records six temperature readings (in °C) from its greenhouse each day and stores them in the array `temps`. The array is indexed from 0. The algorithm below should count how many of the readings are **30 or more** and output the count.

```
01 array temps = [28, 31, 30, 26, 33, 29]
02 hotCount = 0
03 for i = 1 to 6
04     if temps[i] > 30 then
05         hotCount = hotCount + 1
06     endif
07 next i
08 print("Hot readings: " + str(hotCount))
```

(a) The algorithm contains **two** logic errors. Identify the line number of each error and refine the code to correct it. **[4]**

Line number	Corrected line

3 **Total: 6 marks**

A charity auction takes four bids for a painting. The algorithm below should output the **highest** bid.

```
01 highest = 0
02 for bid = 1 to 4
03     amount = int(input("Enter bid amount"))
04     if amount < highest then
05         highest = amount
06     endif
07 next bid
08 print(highest)
```

(a) Complete the trace table for the algorithm when the bids entered are **25**, **40**, **15** and **30**, in that order. You may not need to use all the rows. **[3]**

bid	amount	highest	Output

(b) State the output the auction organisers expected for these four bids. **[1]**

(c) Identify the line number of the logic error and write the corrected line. **[2]**

4 **Total: 6 marks**

A courier depot weighs parcels before loading a van. The program below should ask for the weights of **five** parcels and then output their total weight.

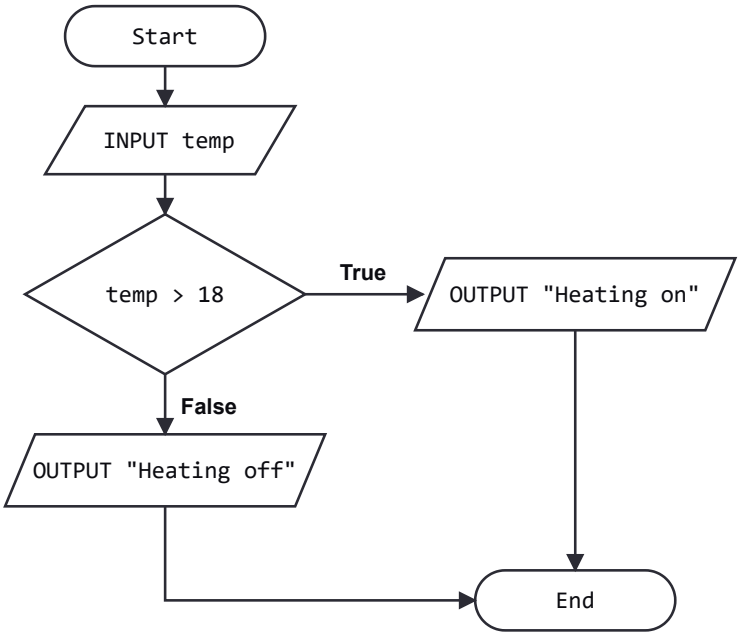
```
01 total = 0
02 count = 0
03 while count < 5
04     total = 0
05     weight = float(input("Enter parcel weight in kg"))
06     total = total + weight
07 endwhile
08 print("Total weight: " + str(total) + " kg")
```

(a) Describe what happens when this program is run. **[2]**

(b) The program contains **two** logic errors. For each error, explain what is wrong and how the code should be refined to correct it. Refer to line numbers in your answer. **[4]**

5 **Total: 2 marks**

A heating controller should switch the heating on when the room temperature is **below 18** °C, and off otherwise. A programmer has drawn this flowchart.



(a) State the output from the flowchart when the temperature input is **12**. **[1]**

(b) Describe how the flowchart should be corrected so that it works as intended. **[1]**

Total for this worksheet: 21 marks