MODULE M PROGRAMMING · M6

Relational (comparison) operators

Original practice questions · 21 marks · ~25 minutes · Cambridge 0478 syllabus 8.1.4(f), 8.1.4(b), 8.1.4(c)

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. All code on this sheet is written in pseudocode. Write all code answers in pseudocode. The marks for each part are shown in brackets [ ]. The total for this worksheet is **21 marks**.

1

Total: 4 marks

(a) Complete the table. Write the meaning of each relational operator given, or the relational operator for the meaning given. **[3]**

Relational operator	Meaning
<>	
	Less than or equal to
=	

(b) State the data type of the result of a relational operation, such as `Price < 10`. **[1]**

2

Total: 4 marks

A booking algorithm for a coach company has assigned these values.

```
Seats ← 40
Booked ← 40
Row ← 'C'
Groups ← 6
```

(a) Complete the table to show whether each expression is **TRUE** or **FALSE**. **[4]**

Expression	TRUE or FALSE
`Booked < Seats`	
`Booked <= Seats`	
`Row <> 'D'`	
`Groups * 6 > Seats`	

3 **Total: 3 marks**

Write a condition in pseudocode for each rule. Use the identifier given in bold.

(a) A bus is full when the number of passengers, **Passengers**, is 72 or more. **[1]**

(b) A tablet shows a battery warning when the charge, **Charge**, is less than 15. **[1]**

(c) A login screen shows an error when the password entered, stored as a string in **Password**, is not Kestrel9. **[1]**

4 **Total: 3 marks**

An algorithm controls a fridge in a sandwich shop. It should:

- output **Too warm** if the temperature is 8 °C **or higher**, otherwise output **Temperature OK**
- run the cooler **while** the temperature is **above** 4 °C. Each time the cooler runs, the temperature goes down by 1
- output **Close the door** if the door status is **not** 'C' (closed).

```
01 DECLARE Temp : INTEGER
02 DECLARE Door : CHAR
03 INPUT Temp
04 IF Temp > 8
05   THEN
06     OUTPUT "Too warm"
07   ELSE
08     OUTPUT "Temperature OK"
09 ENDIF
10 WHILE Temp < 4 DO
11     OUTPUT "Cooler on"
12     Temp ← Temp - 1
13 ENDWHILE
14 INPUT Door
15 IF Door != 'C'
16   THEN
17     OUTPUT "Close the door"
18 ENDIF
```

(a) There are **three** errors in the algorithm. Identify the line number of each error and suggest a correction. **[3]**

Line number	Correction

5 **Total: 3 marks**

A wind turbine checks the wind speed, in km/h.

```
01 INPUT Speed
02 IF Speed > 60
03   THEN
04     OUTPUT "Stop blades"
05   ELSE
06     IF Speed < 25
07       THEN
08         OUTPUT "Too little wind"
09       ELSE
10         OUTPUT "Generating"
11     ENDIF
12 ENDIF
```

(a) Complete the table to show the output of the algorithm for each input. **[3]**

Input	OUTPUT
60	
25	
24	

6 **Total: 4 marks**

A farm uses an algorithm to check the water level, in cm, in a cattle trough.

(a) Write an algorithm using pseudocode to: **[4]**

- input the water level
- output **Overflow warning** if the level is more than 180
- output **Refill needed** if the level is 20 or less
- output **Level normal** for any other level.

Only one message should be output. You do not need to declare any variables.

Total for this worksheet: 21 marks