MODULE M PROGRAMMING · M8

Selection: IF, ELSE IF and ELSE

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 8.1.4(b), 8.1.5, 7.7, 7.8, 7.9

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 **20 marks**. All algorithms on this sheet are written in pseudocode. Write your own algorithms in pseudocode.

1

Total: 2 marks

(a) Tick (✓) **one** box to show which statement describes **selection**. **[1]**

	Statement	Tick (✓)
A	The statements are run one after another, in the order they are written.	
B	A condition is tested and the result decides which statements are run next.	
C	A group of statements is repeated a set number of times.	
D	A value is checked to see if it is reasonable before it is accepted.	

(b) An IF statement has a THEN clause and an ELSE clause. **[1]**
State when the statements in the ELSE clause are run.

2

Total: 2 marks

A delivery robot stores its battery charge, as a percentage, in the variable `Charge`.

(a) Write a pseudocode IF statement that outputs `Return to base` when `Charge` is less than 15. **[2]**
Nothing is output when `Charge` is 15 or more.

3 **Total: 5 marks**

A pump fills a water tank. This algorithm sets the pump speed from the water level in the tank, as a percentage.

```
01 INPUT Level
02 IF Level > 90
03   THEN
04     OUTPUT "Pump off"
05   ELSE
06     IF Level >= 40
07       THEN
08         OUTPUT "Pump low"
09       ELSE
10         OUTPUT "Pump high"
11     ENDIF
12 ENDIF
```

(a) Complete the table to show the output for each input value. **[4]**

Level	OUTPUT
90	
95	
40	
12	

(b) Explain why the condition on line 06 is **not** tested when the input is 95. **[1]**

4 **Total: 5 marks**

A shop gives each customer a loyalty level from the points they have collected:

- 250 points or more: `Gold`
- 100 to 249 points: `Silver`
- fewer than 100 points: `Standard`

This algorithm should output the correct level. It contains an error.

```
01 INPUT Points
02 IF Points >= 100
03   THEN
04     Level ← "Silver"
05   ELSE
06     IF Points >= 250
07       THEN
08         Level ← "Gold"
09       ELSE
10         Level ← "Standard"
11     ENDIF
12 ENDIF
13 OUTPUT Level
```

(a) State the output when the input is 300. **[1]**

(b) Explain why the algorithm never outputs `Gold`. **[1]**

(c) Rewrite lines 02 to 12 using pseudocode so that every customer is given the correct level. **[3]**

5 **Total: 6 marks**

At a ferry port, vehicles queue in different lanes depending on their height, in metres.

(a) Write an algorithm using pseudocode to: **[6]**

- input the height of a vehicle
- output `Lane A` if the height is up to and including 2.0
- output `Lane B` if the height is more than 2.0 and up to and including 3.5
- output `Lane C` if the height is more than 3.5 and up to and including 4.5
- output `Too tall` if the height is more than 4.5.

Only **one** message must be output for each vehicle. Use IF statements. You do not need to declare any variables.

Total for this worksheet: 20 marks