MODULE M PROGRAMMING · M8

Selection: IF, ELSE IF and ELSE

Original practice questions · 20 marks · ~25 minutes · OCR J277 spec 2.2.1, 2.1.2

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 code on this sheet is written in OCR Exam Reference Language.

1

Total: 2 marks

Sequence, selection and iteration are the three basic programming constructs.

(a) Describe what is meant by **selection** in a program. **[2]**

2 **Total: 5 marks**

A greenhouse controller sets its cooling fan from the air temperature, in °C.

```
01 temp = int(input("Enter temperature"))
02 if temp > 40 then
03     print("Alarm")
04 elseif temp >= 30 then
05     print("Fan high")
06 elseif temp >= 22 then
07     print("Fan low")
08 else
09     print("Fan off")
10 endif
```

(a) Complete the table to show what the program outputs for each input. **[4]**

Input `temp`	Output
22	
30	
40	
15	

(b) When the input is `45`, the conditions on line 02 **and** line 04 are both true, but only `Alarm` is output. Explain why. **[1]**

3 **Total: 4 marks**

A fitness centre gives each member a badge for the number of classes they attended in a month:

- 12 or more classes: `Gold`
- 8 to 11 classes: `Silver`
- 4 to 7 classes: `Bronze`
- fewer than 4 classes: `None`

A programmer writes this program.

```
01 classes = int(input("Classes attended"))
02 if classes >= 4 then
03     badge = "Bronze"
04 elseif classes >= 8 then
05     badge = "Silver"
06 elseif classes >= 12 then
07     badge = "Gold"
08 else
09     badge = "None"
10 endif
11 print(badge)
```

(a) State what the program outputs when `classes` is 10. **[1]**

(b) The program never outputs `Silver` or `Gold`. Explain why. **[1]**

(c) Refine lines 02 to 07 so that every member gets the correct badge. **[2]**

4 **Total: 3 marks**

A goods lift in a warehouse uses a nested `if` statement to decide whether it can move. The maximum load is 600 kg.

```
01 load = int(input("Load in kg"))
02 doorClosed = input("Door closed? Y/N")
03 if doorClosed == "Y" then
04     if load <= 600 then
05         print("Lift moving")
06     else
07         print("Overloaded")
08     endif
09 else
10     print("Close the door")
11 endif
```

(a) Complete the table to show what the program outputs for each set of inputs. **[3]**

Input `load`	Input `doorClosed`	Output
600	"Y"	
720	"N"	
650	"Y"	

5 **Total: 6 marks**

A parcel shop has storage lockers in three sizes. A program tells staff which locker to use from the length of a parcel's longest side, in cm.

(a) Write a program that: **[6]**

- asks the user to enter the length of the parcel's longest side
- outputs `Invalid` if the length is 0 or less
- outputs `Small` if the length is more than 0 and up to and including 30
- outputs `Medium` if the length is more than 30 and up to and including 50
- outputs `Large` if the length is more than 50 and up to and including 80
- outputs `Too big` if the length is more than 80.

Only **one** message must be output for each parcel.

You must use either: OCR Exam Reference Language, or a high-level programming language that you have studied.

Total for this worksheet: 20 marks