MODULE M PROGRAMMING · M23

Functions and return values

Original practice questions · 22 marks · ~25 minutes · OCR J277 spec 2.2.3

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**. Code is written in OCR Exam Reference Language. All data on this sheet is made up.

1

Total: 3 marks

(a) Tick (✓) **one** box in each row to show whether each statement describes a function, a procedure, or both. **[3]**

Statement	Function	Procedure	Both
It is a named sub program that is defined once and can be called many times.			
It uses `return` to send a value back to the point where it was called.			
It carries out a task but does not return a value.			

2

Total: 4 marks

A print shop charges 5p for every page it prints. Its ordering program uses this function to work out the cost, in pence, of a print job.

```
01 function printCost(pages, copies)
02     totalPages = pages * copies
03     cost = totalPages * 5
04     return cost
05 endfunction
```

(a) Give the line number of the statement that sends a value back to the point where the function was called. **[1]**

(b) State the value returned by `printCost(3, 4)` **[1]**

(c) A customer orders two print jobs: **[2]**

- a 2-page leaflet, 5 copies
- a 4-page booklet, 3 copies.

Write **one** statement that uses the function `printCost()` to store the total cost of both jobs in the variable `orderTotal`

3 **Total: 5 marks**

A warehouse packs items into boxes. Each box holds up to 8 items. This function works out how many boxes an order needs.

```
01 function boxesNeeded(items)
02     boxes = items DIV 8
03     if items MOD 8 != 0 then
04         boxes = boxes + 1
05     endif
06     return boxes
07 endfunction
```

(a) Complete the table to show the value returned by each function call. **[3]**

Function call	Value returned
boxesNeeded(16)	
boxesNeeded(17)	
boxesNeeded(5)	

The main program uses the function like this:

```
10 orders = int(input("Enter the number of items"))
11 if boxesNeeded(orders) > 2 then
12     print("Use a trolley")
13 else
14     print("Carry by hand")
15 endif
```

(b) State what the program outputs when the user enters: **[2]**

20 .....

16 .....

4 **Total: 4 marks**

A water-quality sensor takes three readings. The program below should:

- use the function `meanReading()` to **return** the mean of three readings
- store the mean of the readings 4, 9 and 8 in the variable `result`, then output it.

The program contains **two** errors.

```
01 function meanReading(first, second, third)
02     total = first + second + third
03     mean = total / 3
04     print(mean)
05 endfunction
06 meanReading(4, 9, 8)
07 print("Mean reading is " + str(result))
```

(a) Identify the line number of each error and write the corrected line of code. **[4]**

Error 1 Line number ..... Corrected line

Error 2 Line number ..... Corrected line

5 **Total: 6 marks**

A hotel heating system checks whether a room is at a comfortable temperature. A temperature, in °C, is comfortable if it is from 18 to 24 inclusive. Temperatures can include decimals, such as 21.5

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

- defines a function called `isComfortable()` that takes a temperature as a parameter and returns `True` if the temperature is comfortable, or `False` if it is not
- asks the user to enter a room temperature and stores it
- calls `isComfortable()` with the temperature entered
- outputs `Comfortable` if the function returns `True`, otherwise outputs `Adjust heating`.

You must use either:

- OCR Exam Reference Language, or
- a high-level programming language that you have studied.

Total for this worksheet: 22 marks