1.2 SOFTWARE & SOFTWARE DEVELOPMENT · 1.2.3

Writing & following algorithms

Original practice questions · 33 marks · about 45 minutes · spec 1.2.3(c) · answer in OCR pseudocode

Instructions. Answer all questions. Write programs in OCR Exam Reference Language (pseudocode). The number of marks is shown in brackets [ ].

1

Total: 6 marks

The algorithm below is run.

```
num = input("Enter a number")
count = 0
while num > 0
    num = num DIV 2
    count = count + 1
endwhile
print(count)
```

(a) State the output when the user enters **7**. **[1]**

(b) State the output when the user enters **20**. **[1]**

(c) Complete the trace table below for an input of **7**. **[4]**

num	count

2

Total: 4 marks

Write a pseudocode algorithm that inputs 5 numbers and outputs the **largest** of them. **[4]**

3 **Total: 5 marks**

Write a function `countVowels(text)` that returns the number of vowels (a, e, i, o, u) in the string `text`. **[5]**

4 **Total: 4 marks**

The function below is defined.

```
function mystery(a, b)
    while a != b
        if a > b then
            a = a - b
        else
            b = b - a
        endif
    endwhile
    return a
endfunction
```

(a) State the value returned by `mystery(12, 8)`. **[1]**

(b) State the value returned by `mystery(20, 30)`. **[1]**

(c) State what the function `mystery` calculates. **[2]**

5 **Total: 6 marks**

In a two-player game, a running total starts at 0. Players take turns to add either 1 or 2 to the total. The player who makes the total reach 20 or more is the winner.

Write a pseudocode algorithm that runs the game: alternate between the two players, input each player's choice (1 or 2), add it to the total, and output which player wins. **[6]**

6 **Total: 8 marks**

A system checks new passwords. A password is valid if it is **at least 8 characters** long **and** contains **at least one digit** (0–9).

(a) Write a function `isValid(password)` that returns `true` if the password meets both rules and `false` otherwise. **[5]**

(b) Write code that repeatedly asks the user for a password until a valid one is entered, using your function. **[3]**

END OF QUESTIONS