

2.2 PROGRAMMING TECHNIQUES · 2.2.1(A)

Sequence, selection & iteration

Original practice questions · 30 marks · about 45 minutes · spec 2.2.1(a)

Instructions. Answer all questions. Marks are shown in brackets []. Write algorithms in OCR pseudocode or a high-level language of your choice.

1 Total: 6 marks

(a) Name the **three** programming constructs from which all programs are built. [3]

(b) Explain the difference between *count-controlled* and *condition-controlled* iteration. [2]

(c) State the difference between = and == in pseudocode. [1]

2 Total: 6 marks

Study the algorithm below.

```
01 x = 10
02 count = 0
03 while x > 1
04   x = x DIV 2
05   count = count + 1
06 endwhile
07 print(count)
```

(a) Complete the trace table (add rows as needed). [4]

x	count	x > 1 ?
10	0	

(b) State the value printed by line 07. [1]

(c) State whether this loop is count-controlled or condition-controlled. [1]

3

Total: 6 marks

A program assigns a grade from a mark:

```
01 if mark >= 70 then grade = "A"
02 elseif mark >= 50 then grade = "B"
03 elseif mark >= 40 then grade = "C"
04 else grade = "U"
05 endif
```

- (a) State the grade produced when mark is 55, 70 and 38. [3]
- (b) Explain why only one grade is assigned, even though 70 also satisfies `mark >= 50`. [2]
- (c) Name the programming construct used here. [1]

4

Total: 6 marks

- (a) Write an algorithm that inputs 5 numbers and outputs their total, using a count-controlled loop. [5]

- (b) State why a count-controlled loop is suitable here. [1]

5

Total: 6 marks

- (a) Write an algorithm that repeatedly asks for a password until the user enters "open123", using a DO...UNTIL loop. [4]

- (b) Explain why a count-controlled (FOR) loop would **not** be suitable here. [1]
- (c) State one difference between a WHILE loop and a DO...UNTIL loop. [1]

END OF QUESTIONS