

“3-a-day” A-Level Exam Practice Unit 2 (008)

Question 1

Iteration is one of the three basic constructs of procedural programming languages.

State the names of the other **two** basic constructs.

1

2 [2]

Question 2

The FOR loop and the WHILE loop are two different types of iteration construct.

Describe **one** difference between a FOR loop and a WHILE loop.

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..... [2]

Question 3

As part of her A-Level Computing project, Myriam writes the following code which displays how a bank investment will grow each year.

```
01 PROCEDURE B(p: INTEGER, r: REAL, t: INTEGER)
02     FOR i = 1 to t
03         p = p + p * r
04         OUTPUT t, p
05     NEXT i
06 END PROCEDURE
```

State how many lines will be output if the procedure is called with the following arguments.

p = 10000, r = 0.05, t = 3

Number of lines output

P = 2500, r = 0.25, t = 0

Number of lines output [2]

Rewrite this procedure so that it uses a WHILE loop instead of a FOR Loop.

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..... [4]

Answer 1

- Sequence
- Selection.

2

Answer 2

- The FOR Loop is set up with a fixed number of iterations
- The WHILE runs repeatedly depending on a condition.

2

Answer 3

- 3
- 0
(respectively)

2

Eg
 PROCEDURE B(p : INTEGER, r: REAL, t: INTEGER)
 i = 1
 WHILE i <= t
 p = p + p * r
 OUTPUT t, p
 i = i + 1
 END WHILE
 END PROCEDURE

- The procedure is correctly declared and uses a while loop
- Correctly initialises i before loop starts
- Increments i within loop, in correct place
- Correct end condition for loop

4

Do not accept a simple substitution of the word FOR with WHILE. There must be a recognisable valid WHILE loop to award the first bullet point.

 To “correctly initialise” the loop the first line output should be for t = 1
 (ie either initialise i=0 and increment before the output, or initialise i=1 and increment after the output).