

Surname	Centre Number	Candidate Number
First name(s)		2



## GCE AS/A LEVEL

2500U10-1



S24-2500U10-1

**TUESDAY, 14 MAY 2024 – AFTERNOON**

### COMPUTER SCIENCE – AS unit 1 Fundamentals of Computer Science

2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	6	
2.	8	
3.	8	
4.	8	
5.	8	
6.	6	
7.	6	
8.	4	
9.	8	
10.	8	
11.	8	
12.	6	
13.	6	
14.	10	
<b>Total</b>	<b>100</b>	

#### ADDITIONAL MATERIALS

A calculator.

#### INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

#### INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

The total number of marks available is 100.

Assessment will take into account the quality of written communication used in your answers.



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Answer **all** questions.

1. Draw a truth table for the following Boolean expression:

[6]

$$X = P \oplus Q + R.(P + \bar{Q})$$







4. (a) Describe the term 'word length' in relation to a CPU. [1]

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(b) Convert the denary number  $27_{10}$  and the hexadecimal number  $7E_{16}$  into two 8-bit binary numbers. Add the two numbers together using binary addition, leaving your answer in binary.

You must show all of your workings. [4]

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(c) Using the binary number  $101.0101_2$ , demonstrate truncation to one binary place, and calculate the effect upon accuracy in terms of relative error. [3]

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6. Describe the difference between fixed and variable length records. Give an example of data that could be contained in each. [6]

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8. Describe computer-based processes that protect the security of data.

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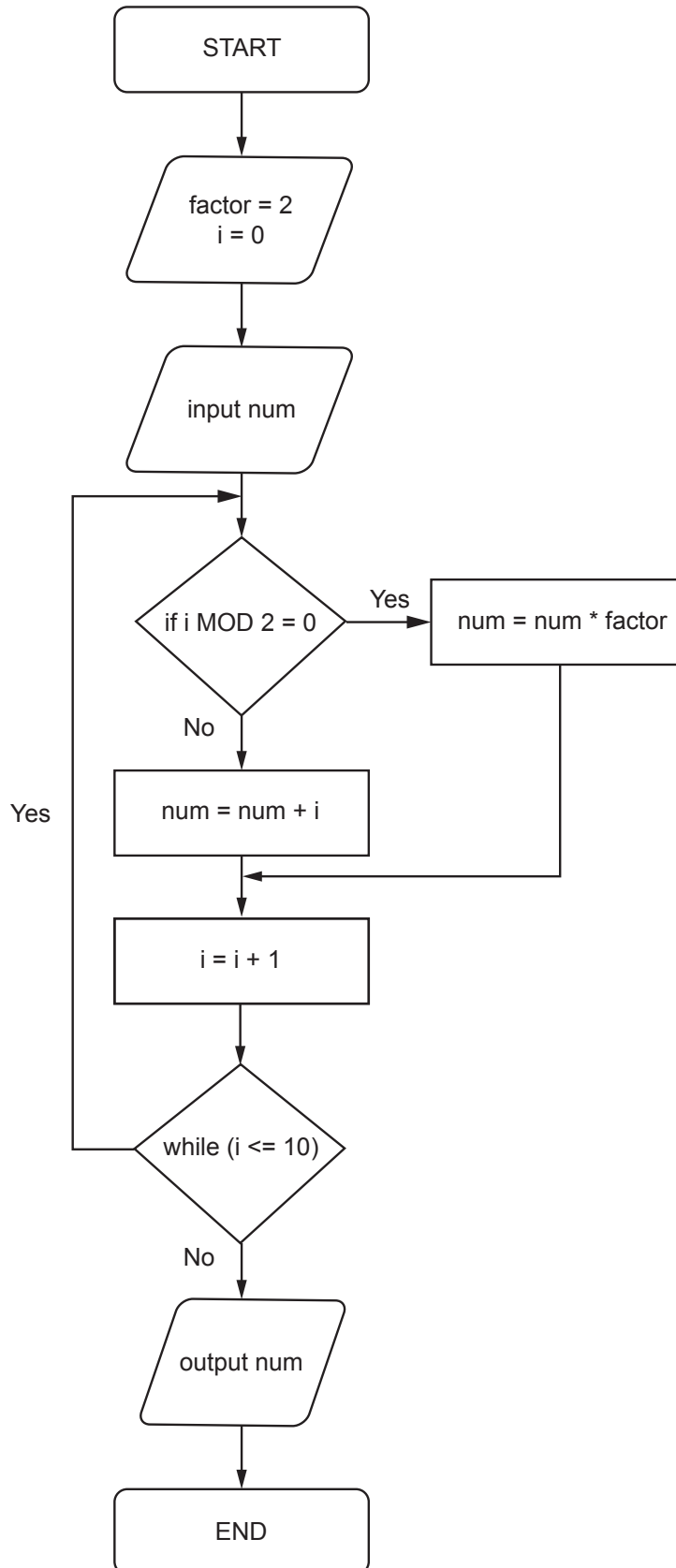
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9. Consider the constructs in the following algorithm.  
Note: there is no need to dry-run the algorithm.



Identify and describe the purpose of the following constructs in the algorithm:

(a) Constant. [2]

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(b) Variable. [2]

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(c) Selection. [2]

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(d) Repetition. [2]

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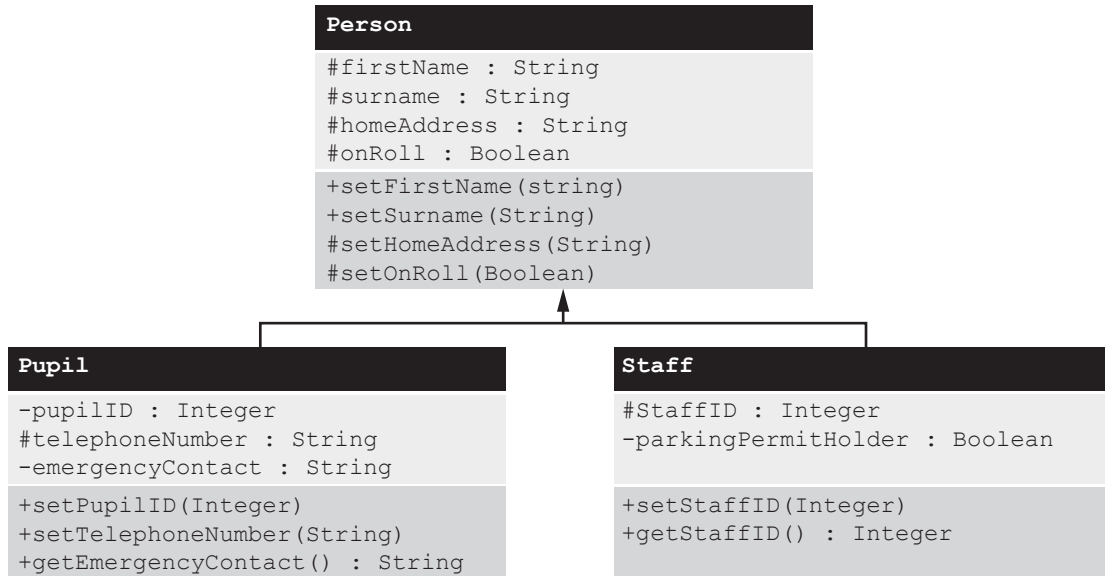
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10. Object-oriented programming is a paradigm that organises code into reusable, modular objects that can interact with each other to accomplish specific tasks.

Consider the following class diagram for a school:



(a) Describe the relationship between an object and a class.

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(b) Give **one** example for each of the following from the class diagram opposite.

(i) Super class.

[1]

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(ii) Sub class.

[1]

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(iii) Method that does not require a parameter.

[1]

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(c) Describe the difference between public, private and protected methods.

[3]

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11. Describe the contents and use made of the following documentation:

(a) User documentation.

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(b) Maintenance documentation.

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13. Describe the following stages in the compilation process:

(a) Lexical analysis.

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(b) Semantic analysis.

[3]

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A large rectangular area with a solid top and bottom border and a dotted line border on the left and right sides. The interior is filled with horizontal dotted lines, providing a space for writing.



Examiner  
only

Area with horizontal dotted lines for writing.

**END OF PAPER**



