Chhetri Academy

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GCSE COMPUTER SCIENCE

2.1

OCR J277 | Specification point 2.1.1

Computational thinking

Untiered

Past paper question booklet

2	2022-2025	Untiered
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

1 **(a)** Tick (✓) **one** box in each row to identify whether the OCR Reference Language code given is an example of selection or iteration.

OCR Reference Language code	Selection	Iteration

`for i = 1 to 10`
`  print(i)`
`next i`		

`while score != 0`
`  playgame()`
`endwhile`		

`if playerHit() then`
`  score = 0`
`endif`		

`switch bonus:`
`  case 0:`
`  score = 9`
`  case 1:`
`  score = 7`
`  case 2:`
`  score = 5`
`endswitch`		

[4]

(b) Write pseudocode to increment the value held in the variable `score` by one.

.....

..... **[1]**

(c) State the name of each of the following computational thinking techniques.

Breaking a complex problem down into smaller problems.

.....

.....

Hiding or removing irrelevant details from a problem to reduce the complexity.

.....

.....

[2]

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5 A security system protects online credit card payments. The system has three inputs:

Input	Description
A	`True` when the user enters their correct password
B	`True` when the user enters their correct PIN
C	`True` when the card is blocked

The output (P) is `True` if both of the following conditions are `True`:

- the user has entered either their correct password or has entered their correct PIN
- the card is **not** blocked.

(a) Draw the logic circuit for the security system

A

B

C

P

[3]

(b) Complete the truth table for **P = A AND B**

A	B	P

[2]

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(c) Computational thinking techniques were used to design the security system.

Draw **one** line to match each computational thinking technique to its correct example.

Computational thinking technique	Example
Abstraction	The system is broken down into modules for security and payments.
Decomposition	There is an increase in the amount of RAM in the computer running the system
Algorithmic thinking	The user's identity, PIN and password are required. All other data is ignored.
	The step-by-step process for users to securely pay online is designed.

[3]

(d) As part of the security system, the user is asked to choose a 4-digit value for their PIN. This PIN cannot be 1234 or 4321

Create an algorithm that:

- takes the PIN as input as a string
- checks that the PIN is 4 characters in length
- checks that the PIN is **not** either “1234” or “4321”
- outputs `"VALID PIN"` if the PIN meets all of the criteria
- outputs `"INVALID PIN"` if the PIN does not meet all of the criteria.

You do **not** need to check that the digits entered are numeric.

..... **[6]**

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Section B

We advise you to spend approximately 40 minutes on Section B.

Some questions require you to respond using either the OCR Exam Reference Language or a high-level programming language you have studied. These are clearly shown.