



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2026

Computer Science

Sections A & B

Ordinary Level

Wednesday 20 May Morning 9:30 – 11:00

130 marks

Examination Number

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Date of Birth

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For example, 3rd February
2005 is entered as 03 02 05

For Examiner use only								
Section	Question	Mark	Section	Question	Mark	Section	Question	Mark
A	1		A	7		B	13	
	2			8			14	
	3			9			15	
	4			10		Section B Total:		
	5			11		P1 Total (A+B)		
	6			12		C	16	
						P2 (Sec C) Total:		
Section A Total:						Total:		

Instructions

There are **three** sections in this examination. Section A and B appear in this booklet. Section C is in a separate booklet that will be provided for the computer-based element.

Section A	Short Answer Questions	Attempt any nine questions All questions carry equal marks	54 marks
Section B	Long Questions	Attempt any two questions All questions carry equal marks	76 marks
Section C	Programming	Answer all question parts	80 marks

Calculators may **not** be used during this section of the examination.

The superintendent will give you a copy of page 78 (Logic Gates) of the *Formulae and Tables* booklet on request. You are not allowed to bring your own copy into the examination.

Write your answers for Section A and Section B in the spaces provided in this booklet. There is space for extra work at the end of the booklet. Label any such extra work clearly with the question number and part.

Answer any **nine** questions.

Question 1

The Python code below includes a number of variable declarations and arithmetic operations.

1	v = 6
2	w = 4
3	x = 2
4	y = 4
5	z = 5
6	a = v + 2
7	b = w - 1
8	c = x * y
9	d = y / 2
10	e = z % 2

For each variable in Column A, write its final value in Column B after the program runs.

Column A Variable	Column B Value
a	
b	
c	
d	
e	

Question 2

Convert the 4-bit binary number below to a decimal number.

1110

Question 3

A group of secondary school students has been asked to create a Python program for a primary school maths multiplication game.

- (a) One of the requirements is that the game is suitable for the end users.
Who are the end users in this scenario?

--

- (b) The group are following a software development process.
List **two** tasks that the group should undertake during the evaluation stage.

1.
2.

Question 4

Machine learning (ML) is the development of computer systems that are able to learn and adapt without following explicit instructions.



For each of the following scenarios, tick (✓) Yes if it is an example of machine learning, or tick (✓) No if it is **not** an example of machine learning.

	Yes (ML)	No (Not ML)
A spam filter gets better at spotting junk emails the more users mark messages as spam.	☐	☐
A programmer writes code to sort numbers into order.	☐	☐
A calculator uses a formula to find the square root of a number.	☐	☐
A voice assistant (like Siri or Alexa) improves at understanding your accent over time.	☐	☐
A photo app groups pictures of the same person by recognising faces.	☐	☐
Traffic lights are programmed to change every 60 seconds, no matter how many cars are waiting.	☐	☐

Question 5

Figure 1 below is an abstract model of an information system.

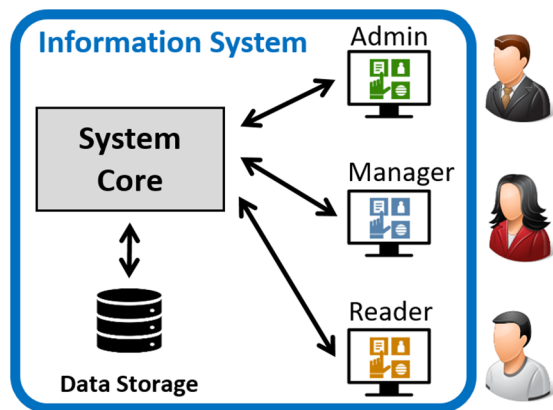


Figure 1

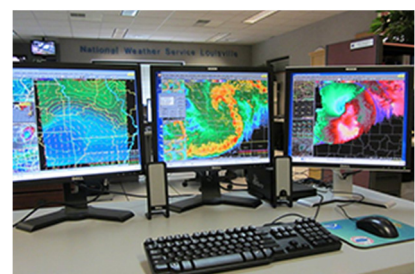
(a) Explain why this diagram is considered an abstract model.

(b) Outline **one** advantage of using an abstract model when designing or analysing an information system.

Question 6

Computer modelling is often used in areas such as weather forecasting, car safety and designing aircraft.

Outline **two** reasons why computer modelling is used instead of real-life testing in these situations.



1.
2.

Question 7

The insertion sort algorithm is applied to the following list of numbers. The first and last pass have been completed. Show the remaining passes by filling in the correct number in each box.

43 22 12 15 17 8

Pass 1

22	43	12	15	17	8
----	----	----	----	----	---

Pass 2

--	--	--	--	--	--

Pass 3

--	--	--	--	--	--

Pass 4

--	--	--	--	--	--

Pass 5

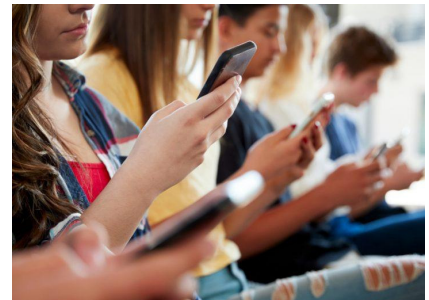
8	12	15	17	22	43
---	----	----	----	----	----

Question 8

“We sit together in the same room while our minds are scattered across dozens of apps, notifications and feeds. We're physically present but mentally absent.”

Kate Middleton, Princess of Wales

Considering the quote above, suggest **one** argument for and **one** argument against the idea that phones are ruining society and relationships.



Argument for:

Argument against:

Question 9

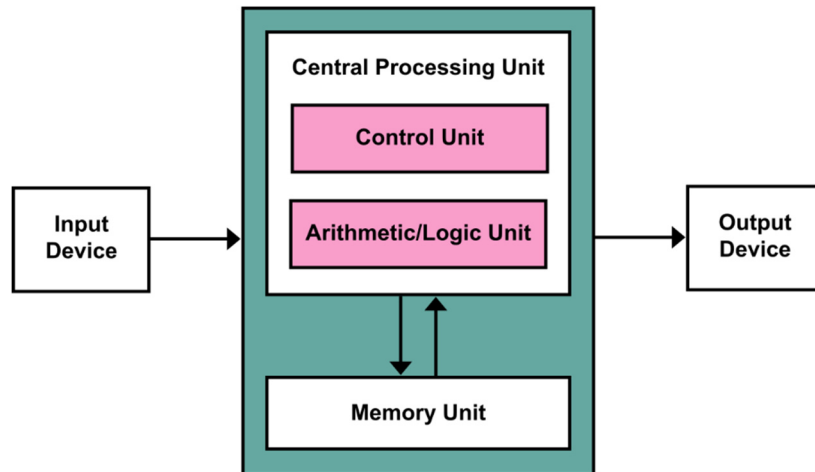


Figure 2

Figure 2 above shows the Von Neumann Architecture Model.

State **two** input devices and **two** output devices commonly found in this model.

Input device 1:
Input device 2:
Output device 1:
Output device 2:

Question 10

A fitness watch collects different types of data such as steps taken, heart rate, calories burned, distance travelled and outside temperature.

Some of this data is discrete, while other data is continuous.



- (a)** State **one** example of discrete data and **one** example of continuous data that a fitness watch might record.

Discrete data example:
Continuous data example:

- (b)** State **one** example of data that might be stored in a list on the watch.

Question 11

The Python code below was written to accept two numbers from a user and output the sum of the numbers. However, there are two syntax errors and one logic (semantic) error in the code. Use the table below to identify the line number, the error and how to fix the error of any **two** such errors.

1	num1 = input("Enter a number: ")
2	num2 = input("Enter another number: "
3	
4	total = num1 + num2
5	
6	print("The total is: " total)

Line number	Explain the error	How to fix the error?

Question 12

ASCII stands for American Standard Code for Information Interchange. Original ASCII is a 7-bit character encoding standard that translates text into codes that computers can process.

Review the characters listed below. Place a tick (✓) in the box next to each character to state whether it can or cannot be encoded using 7-bit ASCII.

Character	Can be encoded	Cannot be encoded
e	☐	☐
R	☐	☐
☺	☐	☐
?	☐	☐
4	☐	☐
✓	☐	☐

Answer any **two** questions.

Question 13

Two common search algorithms are linear search and binary search.

(a) The Python program below shows a linear search algorithm.

```

1 fruits = ["Apple", "Cherry", "Banana", "Orange", "Grape", "Plum"]
2 target = input("Enter the name of the fruit to search for: ").lower()
3 position = 0
4 found = False
5 steps = 0
6 while not found and position < len(fruits):
7     steps += 1
8     if fruits[position].lower() == target:
9         found = True
10        position = len(fruits)
11    else:
12        position += 1
13 if found:
14    print(target, "found after", steps, "steps.")

```

(i) In the table below record the datatype in Column B for each of the variables listed in Column A.

Column A Variable	Column B Datatype
fruits	
target	
position	
found	

(ii) State the output of the program if the user enters "Orange" when asked for a fruit to search for.

--

(iii) Explain why the programmer has used the `lower()` function in this program.

(b) Several Irish counties have been stored into a list. This list is displayed below.

Carlow	Dublin	Galway	Limerick	Monaghan	Roscommon	Waterford
--------	--------	--------	----------	----------	-----------	-----------

- (i)** In the space below, explain the steps that a binary search would use to find the word “Galway”. You can explain using diagrams or in writing.

(ii) Outline **two** differences between the linear search and binary search algorithms.

1.
2.

(c) We are surrounded by sorting and searching algorithms in our daily interaction with technology. Explain **one** example of how companies such as Spotify, Amazon and Netflix use sorting algorithms and **one** example of how they use searching algorithms.

Sorting algorithms:
Searching algorithms:

Question 14

The Irish Presidential Election was held in October 2025, using a traditional paper voting system. In the early 2000s the Irish government planned to introduce electronic voting machines but the plan was scrapped at a large cost to the state.



(a) Over the past few decades technology has been used to automate many manual processes.

(i) In relation to electronic voting machines, explain **one** potential benefit and **one** potential cost of introducing this automated process.

Benefit:
Cost:

(ii) Stakeholder engagement is vitally important in large projects such as this. Identify **two** stakeholders that could have been consulted about the electronic voting machines. For each stakeholder state **one** requirement from the system.

Stakeholder 1:
Requirement:
Stakeholder 2:
Requirement:

(b) The Principles of Universal Design are important as they promote inclusion, equality, and independence for everyone.

(i) Name **two** of the principles, and for each, describe how it would apply to the electronic voting machines.

Principle 1:
Describe:
Principle 2:
Describe:

(ii) As well as voting machines it might be possible to design an app so that people who are immobile can vote from home.
Describe **two** accessibility features that could be built into the app.

1.
2.

(iii) Outline **one** ethical concern with regards to developing an app for voting.

(c) Social media played an important role in the 2025 Irish presidential elections.

(i) Describe **one** way social media algorithms might influence what political content a voter sees.



(ii) Social media has recently been banned in Australia for people under the age of 16.

Many other countries are considering a similar policy.

Put forward **one** argument to support this policy and **one** argument against this policy.



Argument in support:
Argument against:

Question 15

An embedded system is a computer system built into another device to perform specific functions.

Examples include washing machines, robot vacuums, self-service checkouts, and fitness trackers.



(a) Embedded systems are different to the general-purpose laptops and mobile devices that we use on a daily basis.

(i) State **three** advantages of embedded systems over general-purpose computers.

1.
2.
3.

(ii) Embedded systems can take in both digital and analogue inputs.

For each of the hardware items in Column A state, in Column B, whether each one is a digital input or an analogue input.

Column A Hardware	Column B Digital or Analogue
Power button on a dishwasher	
A microphone receiving sound	
A temperature sensor	
A security switch to detect if a door is open or closed	
An outdoor motion detection light	
A street light that turns on based on darkness levels	

- (b) An embedded system is being set up for a laboratory to make sure conditions are correct for samples being stored. The pseudocode for the system is shown below.

```

1  LOOP FOREVER
2    READ temperature
3    READ humidity
4    IF temperature < 5 AND humidity > 70 THEN
5      dehumidifier ← ON
6      cooler ← OFF
7      alarm ← ON
8    ELSE IF (temperature >= 5 AND temperature <= 15) AND (humidity >= 40 AND humidity <= 70) THEN
9      dehumidifier ← OFF
10     cooler ← OFF
11     alarm ← OFF
12  ELSE
13    dehumidifier ← OFF
14    cooler ← ON
15    alarm ← ON
16  END IF
17 END LOOP

```

- (i) In the table below, use Column B to state the status (on/off) of the dehumidifier, cooler and alarm under the particular conditions in Column A.

Column A Conditions	Column B Status (on/off)
Temperature = 12°C, Humidity = 55%	Dehumidifier: Cooler: Alarm:
Temperature = 3°C, Humidity = 80%	Dehumidifier: Cooler: Alarm:
Temperature = 18°C, Humidity = 30%	Dehumidifier: Cooler: Alarm:

- (ii) Identify **two** input devices and **two** output devices used by this embedded system.

Input device 1:
Input device 2:
Output device 1:
Output device 2:

(c) The data from the embedded system is collected in a table and presented below.

Time (24h)	Temperature (°C)	Humidity (%)	Dehumidifier State	Cooler State	Alarm State
09:00	28.4	41	OFF	ON	ON
10:00	35.1	39	OFF	ON	ON
11:00	—	38	OFF	ON	ON
12:00	27.9	Error	OFF	ON	ON
13:00	29.2	40	OFF	ON	ON

(i) The temperature reading at 11:00 is missing, and the humidity value at 12:00 is recorded as “Error”.

Describe **two** problems that issues like these could cause for the laboratory.

1.
2.

(ii) Suggest **one** method the system could use to handle these data issues in order to keep the stored dataset reliable.

Space for extra work.

Indicate clearly the number and part of the question(s) you are answering.

[illegible]

Space for extra work.

Indicate clearly the number and part of the question(s) you are answering.

[illegible]

Acknowledgements

Images

Image on page 4: <https://opensearch.org/platform/machine-learning/>

Image 1 on page 5: <https://www.se-rwth.de/research/Enterprise-Information-Systems/>

Image 2 on page 5: <https://www.weather.gov/about/forecast-process>

Image on page 6: <https://www.siliconrepublic.com/innovation/trinity-eu-erc-grant-teenage-digital-use-social-inequality>

Image on page 7: <https://www.livescience.com/best-fitness-tracker>

Image on page 12: <https://www.independent.ie/irish-news/54m-voting-machines-scrapped-for-9-each/26870212.html>

Image 1 on page 14: <https://extra.ie/2025/10/06/news/catherine-connolly-football-skills-dublin>

Image 2 on page 14: <https://newsforkids.net/articles/2024/12/03/australia-bans-social-media-until-age-16/>

Image on page 15: <https://www.youtube.com/watch?v=DxerQBcdjN0>

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Computer Science – Sections A & B

Wednesday 20 May

Morning 9:30 – 11:00