2025.M103A

2025L065G1EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2025

Technology

Section A and Answerbook

Ordinary Level

Monday 23 June Afternoon 2:00 - 4:00

160 marks

Examination Number

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

Centre Stamp

Instructions

Write your Examination Number and your Date of Birth in the boxes on the front cover.

Write your answers to all parts of the examination into this answerbook. This answerbook will be scanned and your work will be presented to an examiner on screen. Anything that you write outside of the answer areas may not be seen by the examiner.

Write your answers in blue or black pen. You may use pencil for sketches, graphs and diagrams only.

There are three sections in this examination. Attempt **all three** Sections.

Questions for Sections B and C are supplied separately but your answers must be written in this answerbook.

Section A 72 marks

Core – Short-answer questions.

Answer **any nine** questions in this section.

Each question carries 8 marks.

Section B 48 marks

Core – Long-answer questions.

Answer the **two** core questions presented.

Each question in Section B carries 24 marks.

Section C 40 marks

Options – Long-answer questions.

Answer **one** of the five optional questions presented.

Each question in Section C carries 40 marks.

Section A.

Answer **any nine** questions. All questions carry 8 marks.
Write your answers in the spaces provided.

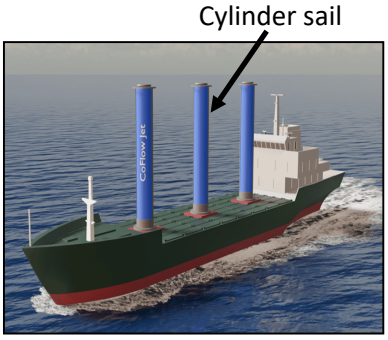
1. The machine shown is commonly used in Technology workshops.

(i) Name the machine.

(ii) State **two** safety precautions which should be observed when using this machine.

1.
2.

2. Giant cylinder sails can cut the fuel consumption of cargo ships by up to 90%. They work by pulling in air, pressurising it, and pushing it out in another direction to create thrust.



(i) State **two** advantages of using this system.

1.
2.

(ii) Suggest **one** possible disadvantage of using these cylinder sails.

3. The safety sign shown is commonly used in everyday life.

(i) State the meaning of the safety sign shown.

(ii) Explain what is meant by safety signs that are **red** in colour.

4. In the box provided, sketch a well-proportioned elevation of the toy when viewed in the direction of arrow **A**.

5. The image shows a resistor commonly used in electronics.

(i) State the function of a resistor in a circuit.

(ii) A voltage of 9 V is applied across a resistor of 100 Ω.
Calculate the current flowing through the resistor.

Calculation:

6. The image shows a structure used in the construction of a warehouse.

(i) Name this type of structure.

(ii) *Struts* and *ties* are commonly used when putting these structures together.
Outline what is meant by a strut and what is meant by a tie when referring to structures.

Strut:

Tie:

7. The image shows a clear *lacquer* finish applied to a wooden product.

(i) State **two** advantages of applying a lacquer finish to wood.

1:
2:

(ii) Outline **one** precaution that should be observed when applying a lacquer.

8. The image shows a wooden cup holder that rests on the arm of a sofa.

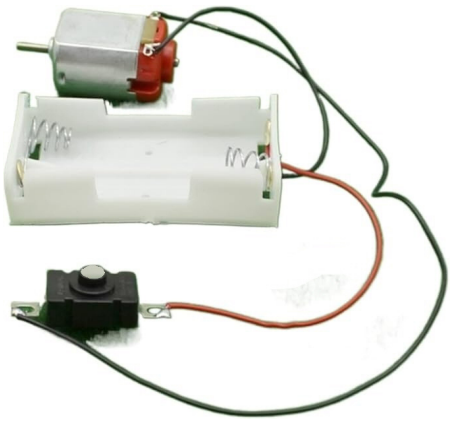
(i) Name a suitable softwood from which to make the cup holder.

(ii) List **three** steps required to manufacture the cup holder.

1.
2.
3.

9. The image shows a DC motor, a push-to-make switch, and a battery box connected to form a simple circuit.

In the space provided, sketch a circuit diagram for this circuit.



10. ICT (Information and Communications Technology) is used daily in schools for communication, learning, and accessing information.

Name **two** forms of ICT you have used and state the purpose of using each.

ICT:
Purpose:

ICT:
Purpose:

11. The mechanism shown below is widely used in industrial machines.

(i) Name the mechanism.

(ii) Outline **two** advantages of using this mechanism.

1.
2.

12. Use **two** graphic techniques to enhance the representation of the coffee cup shown.

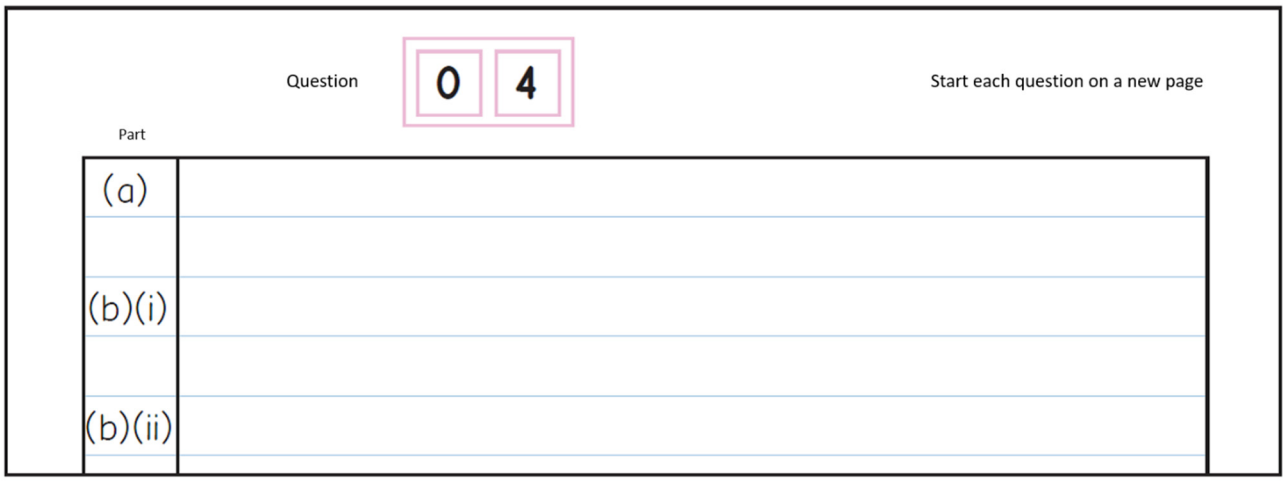
Answerbook for Sections B and C

Instructions

Questions for **Sections B** and **C** are supplied separately.

Start each question on a new page. Write the question number in the box at the top of each page.

Use the left-hand column to label each part, as shown below.



You do not need to use all of the pages in this answerbook. If you run out of space in this answerbook, you may ask the superintendent for more paper.

Write your answers in blue or black pen. You may use pencil for sketches, graphs and diagrams only.

Question

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Acknowledgements

Images
Question 1
https://www.machineryhouse.co.nz/w4330
Question 2
https://interestingengineering.com/transportation/giant-cylinder-sails-cut-fuel-cargo-ships
Question 3
https://www.safetydirect.ie/dependable-no-photography-symbol-signs.html
Question 4
https://www.terenureofficesupplies.ie/2work-mini-2-step-ladder-l2--5
Question 6
https://usframing.com/2022/03/22/pros-and-cons-of-steel-frame-construction/
Question 7
https://www.indiamart.com/proddetail/clear-lacquer-top-coat-12563397462.html?mTd=1
Question 8
https://ie.pinterest.com/pin/177399672810806915/
Question 9
https://www.amazon.de/-/en/BGNERY-Skills-Battery-Switch-Motors/dp/B0BY1ZGPTB
Question 10
https://best-engineering-goods-online.weebly.com/chains-and-sprockets.html
Question 11
https://www.exportersindia.com/product-detail/v-belt-patta-pulley-6433425.htm
Question 12
https://www.iconfinder.com/icons/10674016/.svg_coffee_cup_cardboard_takeaway_takeout_icon

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Leaving Certificate – Ordinary Level

Technology Section A and Answerbook

Monday 23 June

Afternoon 2:00 - 4:00

2025.M103BC

2025L065G2EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2025

Technology

Section B and Section C

Ordinary Level

Monday 23 June Afternoon 2:00 - 4:00

160 marks

Instructions

Section B	48 marks
	Core - Long-answer questions.
	Answer the **two** core questions presented.
	Each question in Section B carries 24 marks.
Section C	40 marks
	Options - Long-answer questions.
	Answer **one** of the five optional questions presented.
	Each question in Section C carries 40 marks.

THESE QUESTIONS ARE TO BE ANSWERED IN THE ANSWERBOOK ATTACHED TO **SECTION A**.

Do not hand this up.

This document will not be returned to the State Examinations Commission.

Section B - Core - *Answer Question 2* ***AND*** *Question 3*

Question 2 - *Answer 2(a)* ***and*** *2(b)*

2(a) *Bolt e-bikes* are available to rent in many Irish towns. They provide fast and affordable urban transport.

(i) Outline **two** environmental benefits of using an e-bike.

(ii) Suggest a suitable material for the manufacture of the e-bike frame. Justify your selection.

2(b) The Bolt e-bike is *ergonomically* designed with an easily adjustable seat and a basket to hold your belongings.

(i) Explain what is meant by the term ergonomics.

(ii) List **two** safety features which should be incorporated into the design of the e-bike.

(iii) Describe, using notes and sketches, how the height of the seat could be adjusted.

Answer 2(c) ***or*** *2(d)*

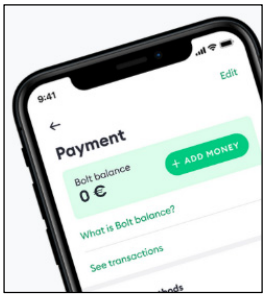
2(c) The e-bikes typically use a 48 V lithium-ion battery and have a range of up to 90 km.

(i) Suggest **two** factors that would affect the range of an e-bike.

(ii) Calculate the power delivered when the motor draws 10 A from the 48 V battery.
Note: P = V × I

OR

2(d) Payments for the rental of the e-bikes are processed through an app.



(i) Outline **two** advantages of using an app to pay for the rental of an e-bike.

(ii) Suggest **two** safety precautions that should be observed when using apps for payment.

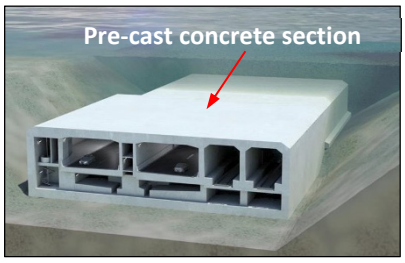
Question 3 - *Answer 3(a)* ***and*** *3(b)*

3(a) The *Fehmarnbelt* is currently the world's longest immersed (underwater) tunnel under construction. It will connect Scandinavia to mainland Europe when it opens in 2029.

(i) Outline **two** advantages of using an immersed tunnel for transportation purposes.

(ii) Describe **two** safety concerns when constructing large infrastructure projects like an immersed tunnel.

3(b) The tunnel consists of 89 pre-cast reinforced concrete sections that will be manufactured in an offshore factory. Concrete is essential for building the tunnel due to its very high compressive strength.



(i) Describe, with the aid of a diagram, what is meant by the term *compression* when referring to materials.

(ii) Suggest **two** benefits of manufacturing the concrete sections in an offshore factory.

(iii) Briefly describe, using notes and sketches, how the concrete sections could be joined together to ensure that the tunnel is watertight when completed.

Answer 3(c) ***or*** *3(d)*

3(c) Large-scale projects, like the Fehmarnbelt tunnel, require careful planning to ensure that they are completed successfully.

(i) Suggest **two** important objectives when planning for the successful completion of the tunnel.

(ii) Describe **one** planning tool that the project planners could use in large scale projects.

OR

3(d) One of the main goals of the Fehmarnbelt project is to build the tunnel sustainably.

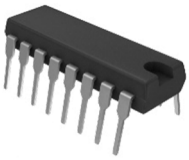
(i) Outline **two** ways the project planners could ensure that the tunnel is built sustainably.

(ii) Describe **one** consequence of not considering sustainability when building large-scale projects.

Section C - Options - *Answer **any one** of the five optional questions.*

Option 1 - Applied Control Systems - *Answer 1(a) **and** 1(b)*

1(a) *Peripheral Interface Controllers* (PICs) are commonly used in washing machines.



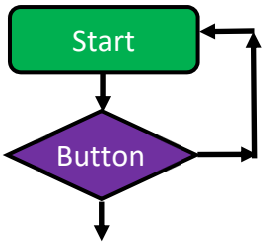
(i) Briefly describe why PICs are useful in washing machines.

(ii) Suggest **two** other household appliances that use PICs.

1(b) The image shows a motorised gate that uses a PIC.

(i) Complete a flowchart to operate the gate in the following sequence:

- When a button is pressed, the motorised gate opens
- After 30 seconds, the gate closes
- The motorised gate must remain closed for a minimum of 10 seconds before it can open again.



(ii) Name a suitable sensor that could be used to stop the gate if an object blocks its path.

(iii) Suggest a modification to the flowchart to stop the gate from closing when an object blocks its path.

*Answer 1(c) **or** 1(d)*

1(c) The image shows a CAD model of a robotic arm that has 6 *Degrees of Freedom*.

(i) Using notes and annotated sketches, explain what is meant by the term degrees of freedom.

(ii) Describe **one** situation where a robotic arm could be used in industry.

OR

1(d) A pneumatically powered hand drill is shown in the image.

(i) Explain, with an example, what is meant by the term *pneumatics*.

(ii) Outline **two** advantages of using pneumatic power.

Option 2 - Electronics and Control - *Answer 2(a) **and** 2(b)*

2(a) The image shows solar photovoltaic panels typically used in a home installation. These panels can have a power output rating of 400 W and typically generate 1.5 kilowatt hours of energy per day.

(i) Outline **two** advantages of using solar photovoltaic panels.

(ii) Describe **one** energy conversion that takes place in a solar panel.

2(b) The image shows a miniature DC motor with an operating range from 1.5 V to 6 V. DC motors are commonly used by students in Technology projects.

(i) Outline what is meant by the abbreviation DC when referring to a motor.

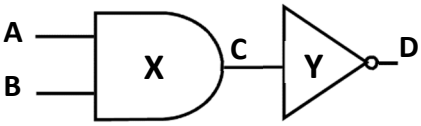
(ii) Draw a labelled diagram of a suitable electronic circuit to control the forward and reverse motion of a DC motor.

(iii) Controlling the speed of the motor can be useful in different situations.

Name an electronic component that could be used to vary the speed of the motor.
Give **one** example of where motor speed control is useful in everyday life.

*Answer 2(c) **or** 2(d)*

2(c) The graphic shows a combination of two logic gates.



(i) Name the logic gates at **X** and **Y**.

(ii) In your answerbook, draw and complete the truth table for the combination of logic gates shown.

A	B	C	D
0	0		
0	1		
1	0		
1	1		

OR

2(d) The image shows a phototransistor. A phototransistor is a light sensitive transistor that allows current to flow between the collector and the emitter in bright conditions.

(i) Describe **one** practical use for a phototransistor.

(ii) Using the *Formulae and Tables* booklet, or otherwise, draw the symbol for a phototransistor.

Option 3 - Information and Communications Technology - *Answer 3(a)* ***and*** *3(b)*

3(a) Email is a method of transferring information from one user to another.

(i) Suggest **two** benefits of using email to transfer information.

(ii) Explain what is meant by the *domain name* with reference to an email address.
Give **one** example of a commonly used domain name.

3(b) Cybercrime has become more sophisticated in recent years, requiring computer users to remain highly vigilant. To combat cybercrime, *biometrics* are frequently employed as a security measure.

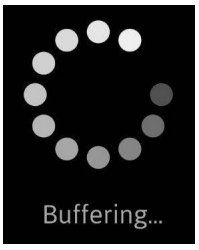
(i) Explain, using **two** examples, what is meant by the term biometrics.

(ii) *Encryption* can be used to protect data.
Outline what is meant by the term encryption.

(iii) Outline **two** other ways people can minimise the threat of cybercrime.

Answer 3(c) ***or*** *3(d)*

3(c) When individuals stream content over the internet, they may experience *buffering* issues that interrupt playback and disrupt their viewing experience.



(i) Explain what is meant by the term buffering.

(ii) Suggest **two** ways to improve the streaming of content at home.

OR

3(d) Image editing software allows you to edit photographs. The image opposite shows how you can adjust the brightness of the image.

(i) Outline **two** other uses for image editing software.

(ii) State **one** advantage and **one** disadvantage of an open-source image editing software.

Option 4 - Manufacturing Systems - *Answer 4(a) **and** 4(b)*

4(a) *The Conformite Europeene* (CE) logo shown is often found on electrical products and on machinery.

(i) Outline what the CE logo tells us about a product.

(ii) State **two** advantages for a company displaying this logo on their product.

4(b) The fashion retailer Zara, has successfully implemented *Just in Time* (JIT) principles in its supply chain and production operations. Zara's approach involves rapid design, production, and distribution of fashion items to respond quickly to changing consumer preferences.

(i) Describe what is meant by Just in Time production.

(ii) Outline **two** advantages of using this production method for a company like Zara.

(iii) Briefly outline **one** difficulty associated with this method of clothes production (fast fashion).

*Answer 4(c) **or** 4(d)*

4(c) *Market research* is essential before a new product is manufactured.

(i) Describe what is meant by the term market research.

(ii) Outline **two** benefits for a company that conducts market research before manufacturing a product.

OR

4(d) A manufacturing company may have a *managing director* and *team leaders* in charge of finance, sales, manufacturing, etc.

(i) Outline the role of the managing director in a company.

(ii) Describe **two** characteristics of an effective team leader.

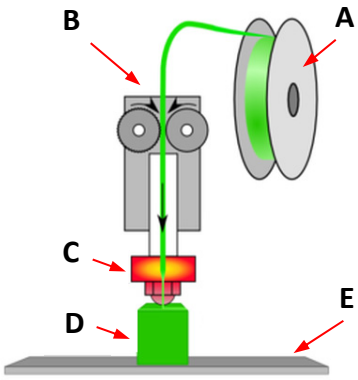
Option 5 – Materials Technology - *Answer 5(a) **and** 5(b)*

5(a) Bryson DeChambeau made history in the 2024 US Open Golf Championship by becoming the first player to win a Major using 3D printed irons.

(i) Outline **two** ways a golfer could benefit from using 3D printed golf clubs.

(ii) Suggest **two** reasons why 3D printing can be a more environmentally friendly method for manufacturing products such as golf clubs.

5(b) The graphic shows the typical operating process of a fused deposition 3D printer.



(i) Briefly describe the operation of the 3D printer, referring to parts **A**, **B**, **C**, **D**, and **E**.

(ii) Outline **two** ways 3D printers can be made safe while in use.

(iii) Suggest **two** items that could be manufactured using a 3D printer.

*Answer 5(c) **or** 5(d)*

5(c) The quality of golf clubs, such as the driver shown, has greatly improved due to advances in technology and the use of innovative materials.

(i) Outline **two** features that would indicate that a golf club was manufactured from high quality materials.

(ii) Suggest **two** ways the quality of the golf club could be tested during its design.

OR

5(d) Modern golf balls are manufactured from polybutadiene, a smart material which can be compressed when struck by a golf club but will return to its original shape.
This *smart material* is called a shape memory material.

(i) Explain what is meant by the term smart material.

(ii) Suggest **one** other use for a shape memory material.

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Acknowledgements

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Image 2 page2: https://bolt.eu/en/ebikes/
Image 3 page2: https://bolt.eu/en/blog/types-of-electric-bikes/
Image 4 page2: https://bolt.eu/en-ie/blog/bolt-balance-a-faster-safer-and-more-convenient-way-to-pay/
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Leaving Certificate – Ordinary Level

Technology Section B and Section C

Monday 23 June

Afternoon 2:00 - 4:00