



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2025

Marking Scheme

Technology

Ordinary Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

The table below contains information about annotations used for marking throughout the examination paper.

Annotation	Use	Marks (if applicable)
✓ ₁	Valid information	1
✓ ₂	Valid information	2
✓ ₃	Valid information	3
✓ ₄	Valid information	4
✓ ₆	Valid information	6
✓ ₈	Valid information	8
SEEN	Surplus information seen by examiner	N/A
0	Incorrect answer	0
⋈	Page seen by examiner/ information not valid	N/A

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.

Band saw.

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

Wear safety glasses, ear defenders, use a protective guard, etc.

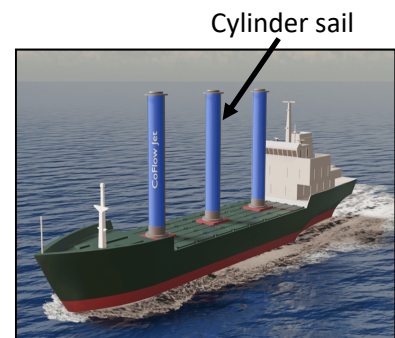


(4+4 marks)

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.

Cheap to run, energy efficient, new technology, etc.



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

Very tall, difficult to install, etc.

(4+4 marks)

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

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

No photography allowed.

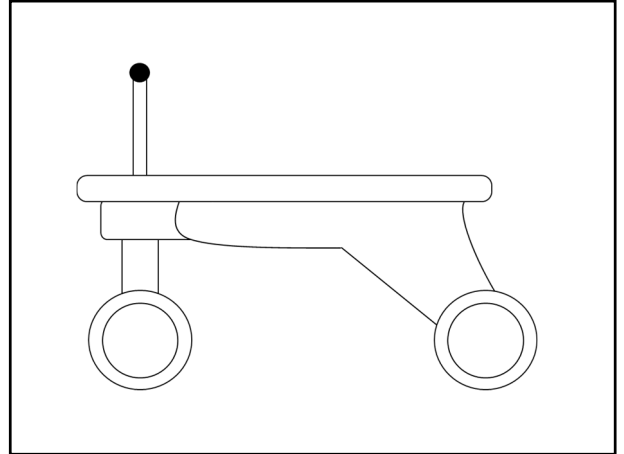


(ii) Explain what is meant by safety signs that are **red** in colour.

Prohibitive action- stop, yield or do what is shown on the sign, etc.

(4+4 marks)

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



(Very good sketch- 8 marks, good sketch- 6 marks, fair sketch 4 marks)

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

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

It limits or regulates the flow of electrical current in an electronic circuit. Resistors can also be used to provide a specific voltage for a component such as a transistor.

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

Calculation:

$$V = I \times R,$$

$$9 = I \times 100$$

$$I = 9/100 = 0.09\text{A (90mA)}$$



(4+4 marks)

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

- (i) Name the type of structure.

Frame 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: This is a structural component that has compression acting on it.

Tie: This is a structural component that has tension acting on it.

(4+4 marks)

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

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

Looks better, lasts longer, stronger, etc.

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

Ventilate the area, wear a face mask, etc.



(4+4 marks)

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.

Scots pine, pine laminboard, etc.

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

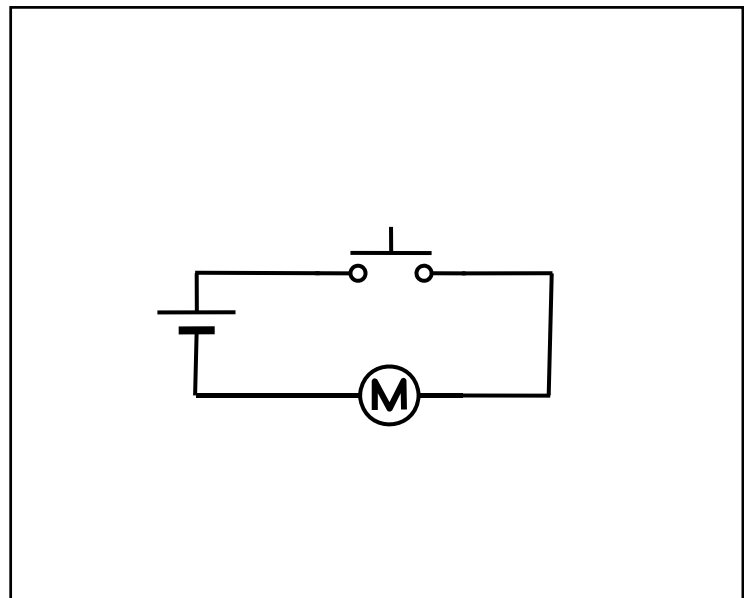
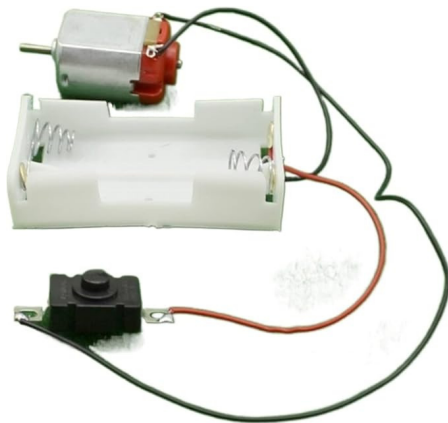
Mark out, cut parts, drill cup holder hole, drill pilot holes, assemble parts, apply a finish, etc.



(4+4 marks)

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.



(Very good diagram- 8 marks, good diagram- 6 marks, fair diagram- 4 marks)

10. ICT (Information and Communication 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: PC/Laptop
Purpose: to write a portfolio

ICT: Solidworks
Purpose: Produce working drawings, CAM files for 3D printing/laser cutting, etc.

(4+4 marks)

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



- (i) Name the mechanism.
Chain and Sprocket.
- (ii) Outline **two** advantages of using this mechanism.
Easy to install, strong, won't slip, etc.

(4+4 marks)

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



**Rendering, colour,
shadow, hatching, etc.**

(4+4 marks)

Section B - Core - Answer Question 2 AND Question 3

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

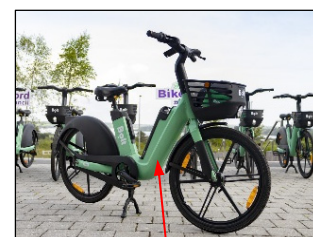
2(a)

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

Less pollution, less cars on the road, etc.

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

Aluminium-lightweight, carbon fibre- strong, etc.



Frame

(10 Marks, 4+6)

2(b)

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

Products designed with human form in mind.

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

Good brakes, good tyres, comfortable seat, lighting, etc.

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

Any relevant method sketched and annotated, e.g., clamp assembly, etc.

(8 Marks, 2+4+2)

Answer 2(c) or 2(d)

2(c)

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

Weight, size of battery, tyre pressure, terrain, etc.

- (ii) Calculate the power delivered when the motor draws 10 A from the 48 V battery.

Note: $P = V \times I$

$P = 48 \times 10 = 480 \text{ W}$

(6 Marks, 4+2)

OR

2(d)

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

Fast, easy to use, secure, etc.

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

Making sure it's the correct app, use a good password, use biometrics, etc.

(6 Marks, 4+2)

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

3(a)

- (i) Outline **two** advantages of using an immersed tunnel for transportation purposes.
Faster, more cost effective, less weather dependent, etc.
- (ii) Describe **two** safety concerns when constructing large infrastructure projects like an immersed tunnel.
Concern for workers when constructing the tunnel, structural integrity if there was a leakage in the tunnel, etc.



(10 Marks, 6+4)

3(b)

- (i) Describe, with the aid of a diagram, what is meant by the term *compression* when referring to materials.
Compression- forces that act to compress or squeeze a material.
- (ii) Suggest **two** benefits of manufacturing the concrete sections in an offshore factory.
Safer working environment, faster production time, etc.
- (iii) Briefly describe, using notes and sketches, how the concrete sections could be joined together to ensure that the tunnel is watertight when completed.
By design the concrete elements could interlock together, use of rubber seals, etc.



(8 Marks, 4+2+2)

Answer 3(c) or 3(d)

3(c)

- (i) Suggest **two** important objectives when planning for the successful completion of the tunnel.
Finish on time, keep on budget, safety, etc.
- (ii) Describe **one** planning tool that the project planners could use in large scale projects.
Gantt chart, WBS, etc.



(6 Marks, 4+2)

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.
Source local materials, carry out manufacturing locally, etc.
- (ii) Describe **one** consequence of not considering sustainability when building large-scale projects.
More expensive, further works would cause inconvenience, etc.

(6 Marks, 4+2)

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

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

1(a)

- (i) Briefly describe why PICs are useful in washing machines.
Allow for multiple programs to be used for different wash cycles, etc.
- (ii) Suggest **two** other household appliances that use PICs.
Microwave, air fryer, heat control unit, etc.

(10 marks, 6+4)

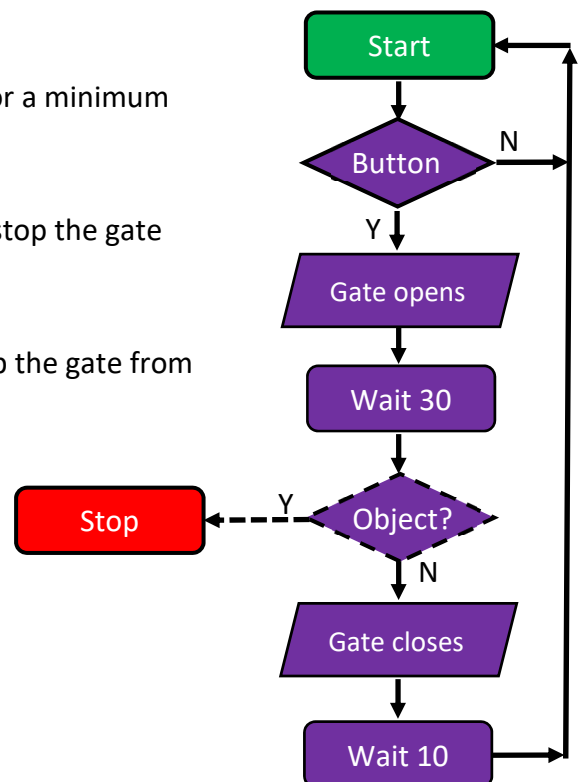
1(b) The image shows a motorised gate that uses a PIC.

- (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.
Motion sensor, LDR, etc.

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



Any valid alternative solution accepted.

(20 Marks, 6+8+6)

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*.
Joints of movement- the number of independent ways a robotic arm or mechanism can move.
- (ii) Describe **one** situation where a robotic arm could be used in industry.
Pick and place objects in an assembly line production, etc.

(10 marks, 6+4)

OR

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

- (i) Explain, with other example, what is meant by the term *pneumatics*.
Using compressed air in mechanical systems to perform tasks. Doors, brakes, dentist drill, etc.
- (ii) Outline **two** advantages of using pneumatic power.
Safety, free source, high speeds, etc.



(10 marks, 6+4)

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

2(a)

- (i) Outline **two** advantages of using solar photovoltaic panels.
Environmental benefits, cheaper bills, etc.
- (ii) Describe **one** energy conversion that takes place in a solar panel.
Light to electric.

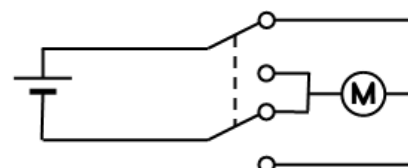


(10 marks, 6+4)

2(b)

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

- (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.

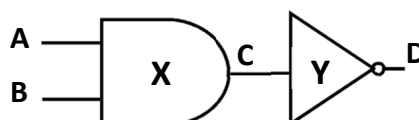
Variable resistor. Roller doors, conveyor belt systems, etc.

(20 Marks, 6+8+6)

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

2(c)

- (i) Name the logic gates at X and Y.
X = And Y = Not



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

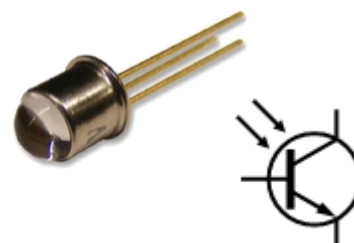
A	B	C	D
0	0	0	1
0	1	0	1
1	0	0	1
1	1	1	0

(10 marks, 6+4)

OR

2(d)

- (i) Describe **one** practical use for a phototransistor.
Dark sensor circuit.
- (ii) Using the *Formulae and Tables* booklet, or otherwise, draw the symbol for a phototransistor.



(10 marks, 6+4)

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.
Cheap, fast, easy to use, etc.
- (ii) Explain what is meant by the *domain name* with reference to an email address.
Give **one** example of a commonly used domain name.
A domain name refers to the website address. Gmail.com, hotmail.com etc.

(10 marks, 6+4)

3(b)

- (i) Explain, using **two** examples, what is meant by the term biometrics.
Physical characteristics that are used to identify an individual.
Fingerprints, facial recognition, etc.
- (ii) *Encryption* can be used to protect data.
Outline what is meant by the term encryption.
Protecting information against unauthorised use by scrambling it.
- (iii) Outline **two** other ways people can minimise the threat of cybercrime.
Using legitimate websites, be careful when disclosing personal data, etc.

(20 Marks, 6+8+6)

Answer 3(c) or 3(d)

3(c)

- (i) Explain what is meant by the term buffering.
When streaming audio or video from the internet, buffering refers to downloading a certain amount of data before starting to play the music or video.
- (ii) Suggest **two** ways to improve the streaming of content at home.
Use a high-speed internet connection, use a wired internet connection, etc.

(10 marks, 6+4)

OR

3(d)

- (i) Outline **two** other uses for image editing software.
Cropping, adding text, etc.
- (ii) State **one** advantage and **one** disadvantage of an open-source image editing software.
Advantage: No cost Disadvantage: Less features

(10 marks, 6+4)

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

4(a)

- (i) Outline what the CE logo tells us about a product.
Conforms to European safety, health and environmental protection requirements.
- (ii) State **two** advantages for a company of displaying this logo on their product.
Generates consumer confidence in a product, easier to sell, etc.

(10 marks, 6+4)

4(b)

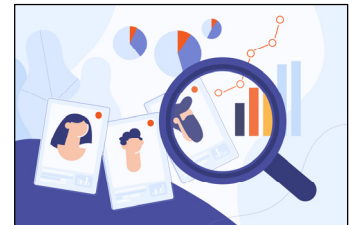
- (i) Describe what is meant by Just In Time production.
Producing goods as customers need them.
- (ii) Outline **two** advantages of using this production method for a company like Zara.
Less storage, no large stock left, etc.
- (iii) Briefly outline **one** difficulty associated with this method of clothes production (fast fashion).
Sourcing materials as you need them, etc.

(20 Marks, 6+8+6)

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.
Evaluating the viability of new product or service.
- (ii) Outline **two** benefits for a company that conducts good market research before manufacturing a product.
Better sales, know what customer wants, etc.



(10 marks, 6+4)

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.
Guidance to employees, strategic advice, etc.
- (ii) Describe **two** characteristics of an effective team leader.
Organisation, delegation, listen to people, etc.



(10 marks, 6+4)

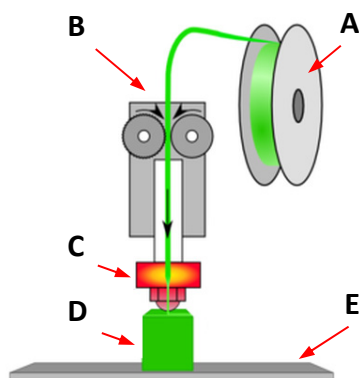
Option 5 – Materials Technology - Answer 5(a) and 5(b)

5(a)

- (i) Outline **two** ways a golfer could benefit from using 3D printed golf clubs.
Custom made to the needs of golfer, design flexibility, on-demand production, etc.
- (ii) Suggest **two** reasons why 3D printing can be a more environmentally friendly method for manufacturing products such as golf clubs.
No waste, less energy required to manufacture, etc.

(10 marks, 6+4)

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.

A- Filament spool, B- The extruder uses torque and a pinch system to feed and retract the filament. C- The heater block melts the filament to a useable temperature. D- The part is printed on the bed E. The print head and/or the bed move to the correct X/Y/Z position for placing the material.

- (ii) Outline **two** ways 3D printers can be made safe while in use.
Use an enclosure to prevent access to hot components, use ventilation, emergency stop, etc.

- (ii) Suggest **two** items that could be manufactured using a 3D printer.
Any relevant examples- components for products, prototypes, etc.

(20 Marks, 6+8+6)

Answer 5(c) or 5(d)

5(c)

- (i) Outline **two** features that would indicate that a golf club was manufactured from high quality materials.
The golf club is consistently accurate in terms of distance or accuracy. The club is easy of use, lightweight, etc.
- (ii) Suggest **two** ways the quality of the golf club could be tested during its design.
Test materials used, machine testing of club- checking accuracy distance, reliability, etc.

(10 marks, 6+4)

OR

5(d)

- (i) Explain what is meant by the term smart material.
A material whose physical or chemical properties can be significantly altered in a controlled and reversible way in response to external stimuli, etc.
- (ii) Suggest **one** other use for a shape memory material.
Glasses, rulers etc.

(10 marks, 6+4)



Leaving Certificate Examination, 2025

Technology

Coursework Briefs

Ordinary Level and Higher Level

200 marks

The Thematic Briefs for the Leaving Certificate Examination 2025 are given overleaf.

The Coursework must be available for assessment by Friday 11 April 2025.

Leaving Certificate Technology

Ordinary Level and Higher Level 2025

Instructions to candidates:

1. The coursework submitted for assessment must consist of two components:
 - a design folio *and*
 - an artefact.
2. If **either** assessment component (written examination or coursework) is submitted at Ordinary Level, the subject is graded at Ordinary Level.
3. All coursework submitted for assessment must be clearly identified with your examination number.
4. The coursework submitted for assessment must be **your own individual work** and must be completed in school under the supervision of the class teacher.
5. Your coursework must not be removed from the school setting under **any** circumstances as doing so may result in such coursework being considered invalid.
6. The design folio should record all stages of your work and should document how the artefact meets the stated thematic brief.
7. Digital drawings or other manufacturing details, if presented for assessment, must be included in **hardcopy** format in your design folio.
8. Where computer aided manufacture (CAM) is used, supporting CAD drawings must be included in your design folio to authenticate your own individual work.
9. The coursework should display knowledge and skills developed through your study of the core and chosen options.
10. All important operating features of the artefact must be clearly visible and be easily accessible without dismantling.
11. Where an electrical supply is used to operate the artefact, it should be of low voltage output. Where specialised equipment is required, it must be set up by you, have clear operating instructions and be ready to use.
12. The coursework presented for assessment must be displayed in an attractive manner. Multimedia presentations, where submitted, must be of **maximum** 3 minutes duration, must be set up by the candidate and must be ready for viewing.
13. You must reference and acknowledge all research sources used such as: publications including books, professional journals and government reports; online sources and other types of media; any material generated using artificial intelligence (AI) software or applications; and material from specialist organisations and relevant individuals. To include such material without properly referencing the source will be considered plagiarism. In addition, the copying from, or reproduction of, material from such sources may also be considered plagiarism.
14. Material copied directly from the Internet or from other sources and presented as your own work will not receive any marks.
15. Any case of suspected copying, plagiarism (which includes the use of AI software), improper assistance, or procurement of work prepared by another party will be thoroughly investigated.

The coursework must be available for assessment by Friday 11 April 2025.

Leaving Certificate 2025 - Ordinary Level

Thematic Brief

Many organisations now offer flexible working arrangements, allowing employees to work from home on certain days each week. To ensure optimal productivity and wellbeing in this remote setup, individuals should strive to create a conducive work environment.

This includes designating a specific workspace, using ergonomic furniture and equipment, organising the work area efficiently, improving lighting and heating, and establishing clear boundaries between work and personal life.

In this context, design and make a working model of a device, system or aid to help an individual work effectively from home. Using modern materials and technologies, your model should incorporate an electronic and/or mechanical system and should be well presented.

Note: The maximum dimension of the artefact you present for assessment should not exceed 500 mm.

If multimedia presentations are used to enhance your display, a hardcopy printout and a digital file (USB flash drive) must be included in your portfolio.

Coursework at Ordinary Level is weighted as follows:

- Design Folio - 40% of marks
- Artefact - 60% of marks

Total - 200 marks

Design Folio - Ordinary Level - 80 marks			
No.	Heading	Description	Marks
1	Analysis, research and investigation	Analysis of thematic brief. Research into chosen area. Analysis of existing solutions.	10
2	Overall management of the project	Analysis of available resources, time and budget constraints; proposed timeframe etc.	5
3	Environmental impact	Impact of materials and production processes; product use; suitability for reuse/recycling.	5
4	Design ideas and selection of optimum solution	Annotated freehand sketches outlining three possible solutions. Optimum solution identified and justified.	10
5	Sketches and drawings for manufacture	Detailed annotated sketches and drawings including all elements/aspects of solution; circuit diagrams/ flowcharts/ models/prototypes/dimensions/scale/assembly details.	15
6	Production planning	Materials and component lists; scheduling, work breakdown structure, costing.	10
7	Product realisation	Sequence of manufacture including photographic record.	15
8	Evaluation and testing	Testing against chosen brief. Evaluation of final artefact. Comparison of planned schedules and actual schedules. Suggested modifications with justification.	5
9	Presentation and ICT	Correct sequence of presentation. Quality of material presented. Acknowledgement of sources. ICT skills in production of folio.	5

Artefact - Ordinary Level - 120 marks			
No.	Heading	Description	Marks
1	Artefact meets theme & specification	Solution presented fulfils the thematic brief and specifications.	15
2	Creativity	Creativity in design, aesthetics & ergonomics. Creative and appropriate use of materials.	15
3	Production skills	Processing of materials. Assembly of materials and components. Range and depth of skills.	30
4	Functionality	Artefact works well. Appropriate/limited use of commercial components/solutions.	30
5	Quality and finish	High quality manufacture. Artefact well finished. Due regard for health and safety.	20
6	Presentation	Coursework well presented. Parts well integrated and labelled where appropriate.	10

Note: *While the general headings and marks above will largely remain the same, breakdowns may vary depending on the actual brief for any given year.*

