



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2023

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
✓ ₅	Valid information	5
✓ 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

Instructions

Write your Examination Number and your Day and Month 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.

1. Two safety signs found in the workplace are shown below.

(i) State the meaning of **each** safety sign.



A: Medical/First Aid



B: No entry

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

Indicates positive action, e.g., a safe escape route or the location of first aid facilities.

(4+4 marks)

2. The Skydweller is an *autonomous* aircraft capable of staying in the air for over ninety days without the need to land, due to the large area of solar panels on both of its wings.



(i) Suggest **two** advantages of using solar panels to power an aircraft.
Lower fuel costs, more innovative, no need to stop for refuel, etc.

(ii) Briefly outline **one** benefit of an *autonomous* aircraft.
No danger of human life.

(4+4 marks)

3. Researchers at Washington State University (WSU) have used disposable masks to improve the strength of concrete by as much as 47%.

(i) Suggest **one** benefit for the environment of using disposable masks to reinforce concrete.

Less waste, reuse, etc.



(ii) Briefly outline the main raw materials used to make concrete.
Sand, cement, gravel, etc.

(4+4 marks)

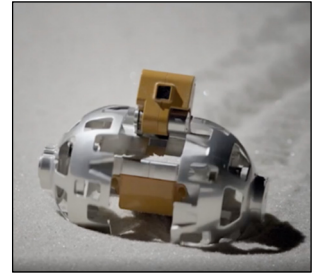
4. Japanese toymaker, Tomy, has developed a mini lunar-rover robot which will be used to take pictures of the lunar surface and transmit them back to Earth. The robot is made from aluminium and plastic.

- (i) Suggest **two** reasons why aluminium is a suitable material for the manufacture of the robot.

Lightweight, non-corrosive, etc.

- (ii) Name a suitable file type (format) that could be used to save images taken by the robot.

Jpeg, PNG, etc.



(4+4 marks)

5. The Dyson Zone™ is an *innovative* wearable technology that combines noise-cancelling headphones with a built-in air purifier.

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

Creative new design, e.g., new features or methods of wearing the technology, etc.



- (ii) These headphones target urban dwellers. Suggest **two** reasons why they are more useful for people living in urban areas.

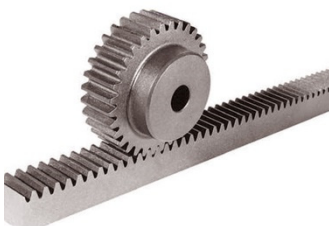
More noise in cities and larger towns, more pollution, etc.

(4+4 marks)

6. The image shows a mechanism which is commonly used in Technology.

- (i) Name the mechanism.

Rack and pinion



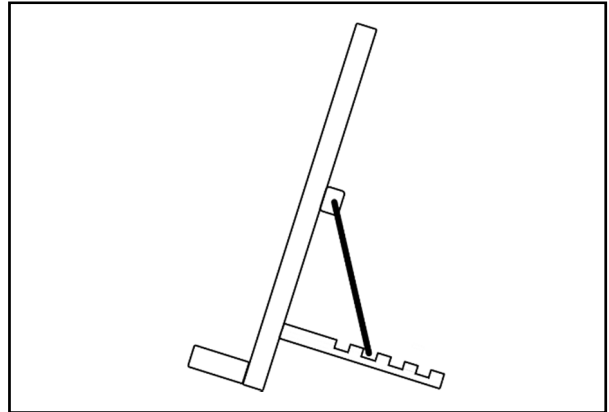
- (ii) Outline **one** application of this mechanism in everyday life.

Steering, pillar drill, etc.

(4+4 marks)

7. The image shows a bamboo cookbook stand.

In the box provided, make a well-proportioned 2D sketch of the cookbook stand when viewed in the direction of arrow **A**.

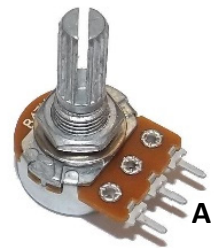


(8 marks)

8. The image shows a component which is commonly used in electronics.

- (i) Name the component.

Variable resistor/Potentiometer, etc.



- (ii) Pin **A** is known as the *wiper* (or *slider*).

State the purpose of the wiper when this component is used in a circuit.

The wiper is a moveable contact. It allows for the resistance between it and one of the outside terminals to be increased/decreased, depending on which way the wiper is turned, etc.

(4+4 marks)

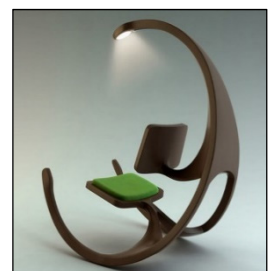
9. The image shows a design for a reading chair.

- (i) List **three** steps required to manufacture the chair.

Mark out design, cut materials, sand/finish, install seat cushion and light, etc.

- (ii) State **two** quality attributes that could be associated with the chair.

E.g., 50 mm cushion thickness to ensure seat comfort, curved legs to allow the chair to rock, ultrabright LEDs to be used to provide appropriate lighting, etc.



(4+4 marks)

10. *Digital technology* is used by students in many ways to capture learning as it happens.

Describe **three** ways in which digital technology can be used when producing a design portfolio for Leaving Certificate Technology.

CAD drawings/Circuit simulation diagrams/flowcharts, graphs, photographic evidence of design journey, presentation of folio, etc.



(3+3+2 marks)

11. The image shows a wheelbarrow. A wheelbarrow acts as a lever when in use.



- (i) What class of lever is a wheelbarrow?

Class two.

- (ii) A load of 300 N is to be lifted in a wheelbarrow. Calculate the effort required if the mechanical advantage is 2:1.

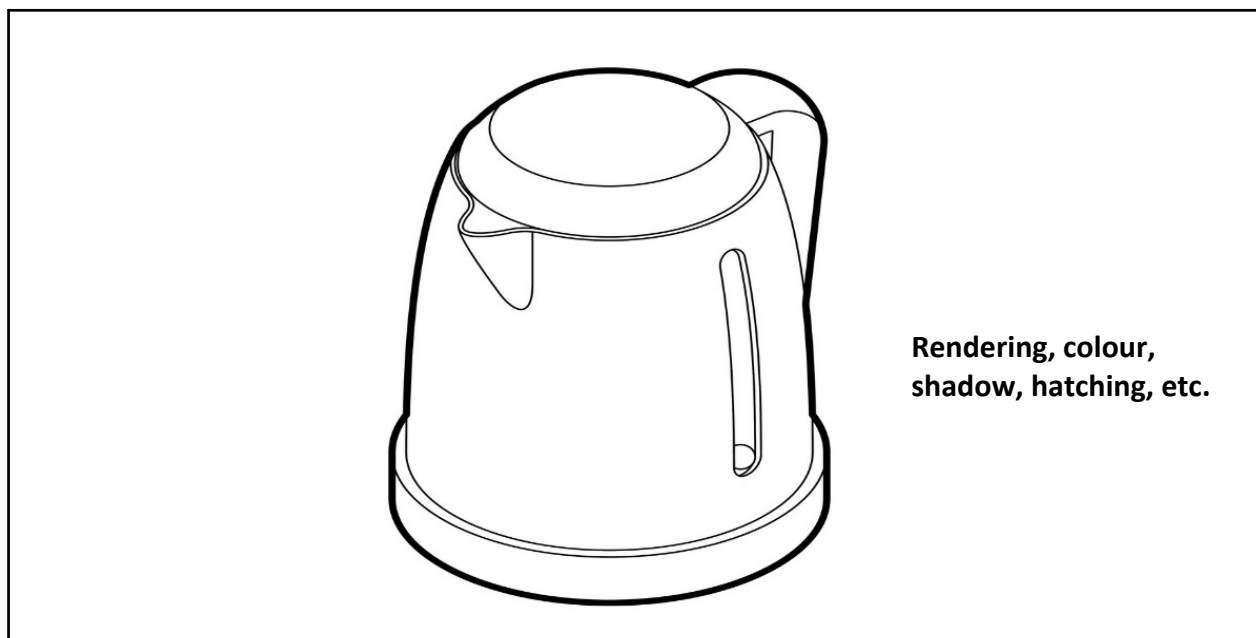
Note: $MA = \text{Load}/\text{Effort}$

$$300\text{N}/\text{Effort} = 2:1$$

$$\text{Effort} = 300/2 = 150\text{N}$$

(4+4 marks)

12. Use **two** graphic techniques to enhance the representation of the electric kettle shown.



Rendering, colour, shadow, hatching, etc.

(4+4 marks)

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

Question 2

(a) - 10 marks, (b) - 8 marks, (c) OR (d) - 6 marks

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

- 2(a) (i) Explain what is meant by the term biodegradable.

A product that is able to decay/breakdown naturally and in a way that is not harmful to the environment, etc.

- (ii) Describe **two** properties which would be important for the material used as the grip on the hurley shown.

Lightweight, non-slippery, etc.

(10 Marks, 4+6)

- 2(b) (i) Describe what is meant by a native hardwood and name **one** other native hardwood.

Grown in Ireland, Oak.

- (ii) Suggest **two** reasons why it is more environmentally friendly to use bamboo instead of ash to manufacture hurleys.

Grows quicker, no need to cut ash trees etc.

- (iii) Outline **two** ways Torpey Hurleys could enhance the sales of their bamboo hurleys.

Any two relevant ways- promotions/ discounted prices, use high- profile players for marketing purposes, etc.

(8 Marks, 2+4+2)



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

- 2(c) (i) Give **two** benefits of purchasing match tickets online.

Faster, easier, no cash required, etc.

- (ii) Briefly outline **two** precautions that should be taken when purchasing match tickets online.

Be careful of suspicious/fake sites, careful with personal data, etc.

(6 Marks, 4+2)

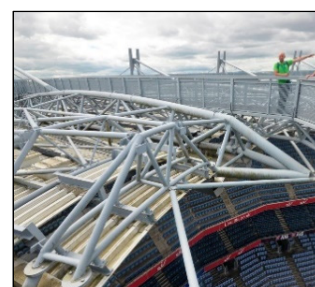
OR

- 2(d) (i) Describe, using annotated sketches, a method used to strengthen the frame structure of the roof.

Triangulation- the roof design involves the use of triangular shapes to give stability to structure.

- (ii) Suggest **one** safety feature which could be included in the design of the rooftop walkway.

Safety railings, use of a harness, etc.



(6 Marks, 4+2)

Question 3

(a) - 10 marks, (b) - 8 marks, (c) OR (d) - 6 marks

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

3(a) (i) Give **two** advantages of having a logo for a club.

Give a club an identity, marketing purposes, etc.

(ii) Suggest a software package that could be used to design the logo.

Canva, Paint shop pro, CAD, etc.

(10 Marks, 6+4)

3(b) (i) Describe what is meant by a 2200 mAh battery and USB power source when referring to the specifications of the model plane.

2200 milliamp hours, Universal Serial Bus, etc.

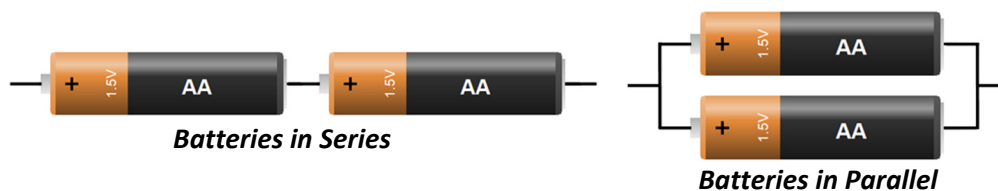
(ii) Calculate the power delivered when the motor draws 2200 mA from the 11 V battery.

Note: $P = V \times I$

2200 mA = 2.2 A

Power = $11 \times 2.2 = 24.2 \text{ W}$

(iii) Describe, using a simple circuit diagram, the difference between batteries connected in *series* and batteries connected in *parallel*.



(8 Marks, 2+2+4)

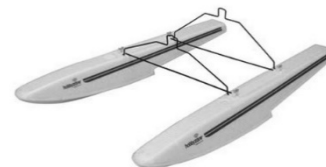
Answer 3(c) **or** 3(d)

3(c) (i) Suggest a suitable material for the manufacture of the floats. Justify your selection.

HIP, aluminium- relevant justification, e.g., lightweight, etc.

(ii) Describe, using notes and sketches, how the floats could be attached to the main body of the airplane.

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



(6 Marks, 2+4)

OR

3(d) (i) Describe what is meant by the term aerodynamics when designing an aeroplane.

This refers to the way that air moves arounds objects such as an aeroplane.

Aerodynamics focuses on reducing drag to allow aircraft fly more efficiently, etc.

(ii) Give **two** reasons for the use of planning tools in large projects.

To ensure that projects are completed on time, schedule the delivery of parts, manage budgets/people, etc.

(6 Marks, 4+2)

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

Option 1 - Applied Control Systems

(a) - 10 marks, (b) - 20 marks, (c) OR (d) - 10 marks

Answer 1(a) and 1(b)

- 1(a) (i) Suggest **two** areas of home living that could benefit from the use of automated systems.

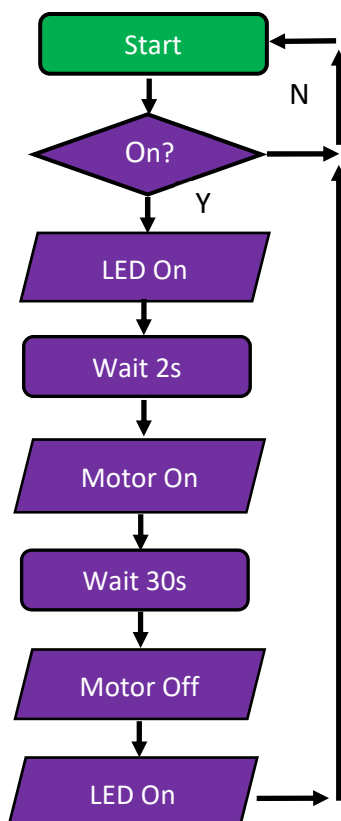
Heating, lighting, IOT devices, etc.

- (ii) Briefly describe **one** disadvantage of using automated systems in everyday life.

Installation costs can be high, over reliance on systems, etc.

(10 marks, 6+4)

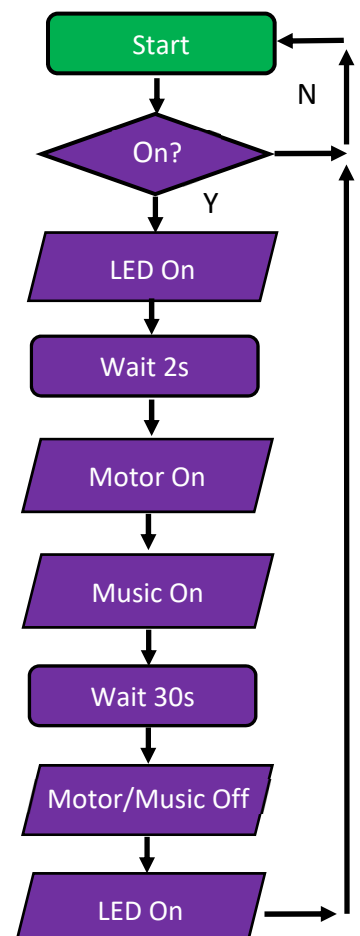
- 1(b) (i) Complete the flowchart to operate the novelty light in the following sequence:



- The light bulb turns on when the button is pressed
- After two seconds the novelty light rotates
- After thirty seconds the novelty light stops rotating and the light bulb turns off.

- (ii) Suggest a modification to the flowchart that allows for music to be played as the novelty light rotates.

Any valid alternative solution accepted.



- (iii) The novelty light above is powered using a *low voltage DC* power supply. Explain the term low voltage DC.
Low voltage - typically implies 0-50 volts,
DC represents direct current generally supplied from batteries or a low voltage DC transformer supply, etc.

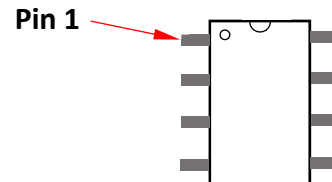
(20 Marks, 8+6+6)

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

1(c) The image shows a PIC which can be used to control devices such as the novelty light in **1(b)** above.



- (i) Give **two** advantages of using a PIC to control devices.
Reprogrammable, adjustments can be made easily, parallel processing, etc.
- (ii) Using an annotated sketch, show how pin number one of a PIC is identified.



(10 Marks, 4+6)

OR

1(d) Pneumatics is the use of pressurised air as a source of energy to do work.

- (i) Describe **two** practical examples of where pneumatic power is used in everyday life.
Brake systems, e.g., car, dentist drills, doors, etc.
- (ii) Describe **one** advantage and **one** disadvantage of using pneumatic power.

Advantage: Safe, free source, etc.

Disadvantage: Expensive, etc.



(10 Marks, 4+6)

Option 2 - Electronics and Control

(a) - 10 marks, (b) - 20 marks, (c) OR (d) - 10 marks

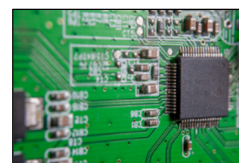
Answer 2(a) and 2(b)

2(a) (i) Explain what is meant by the abbreviation PCB.
Printed Circuit Board.

(ii) Outline the difference between an electrical conductor and an electrical insulator.

An electrical conductor allows electricity to flow through it, e.g., copper, steel.

An insulator prevents the flow of electricity, e.g., plastic, rubber, etc.

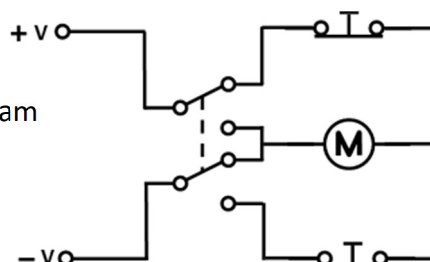


(10 marks, 6+4)

2(b) (i) Explain what is meant by the abbreviation DPDT.

Double Pole Double Throw.

(ii) Using the DPDT symbol shown, draw a circuit diagram for the forward and reverse control of a motor.



(iii) Relays are often used in electronics.

Describe a situation where a relay would typically be used in everyday life.

Relays can be used to control a high voltage secondary circuit from a primary low voltage circuit, e.g., motorised gates, vehicle electrical systems, etc.

(20 Marks, 6+8+6)

Answer 2(c) or 2(d)

2(c) (i) State **two** advantages of using an LED for the torch shown.
Bright, low energy use, etc.



(ii) The torch is powered by two 1.5 V batteries. The voltage drop (V_f) across the LED is 2 V and the maximum current (I_f) that the LED bulb can draw is 0.01 A. Calculate the minimum value of the resistor (R) required to protect the LED.

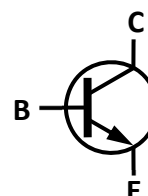
Note: $R = \frac{V - V_f}{I_f}$ $3 - 2 / 0.01 = 1 / 0.01 = 100 \text{ ohms}$

(10 Marks, 4+6)

OR

2(d) (i) Briefly outline **two** functions of a transistor.
Automatic switch, current amplifier, etc.

(ii) Using the Formulae and Tables booklet or otherwise, draw the symbol for a transistor. Label the *base*, the *collector*, and the *emitter* on your diagram.



(10 Marks, 4+6)

Option 3 - Information and Communications Technology

(a) - 10 marks, (b) - 20 marks, (c) OR (d) - 10 marks

Answer 3(a) and 3(b)

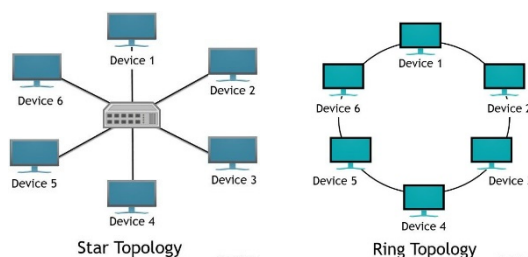
- 3(a) (i) Name **two** video-conferencing platforms.
Zoom, Microsoft Teams, Google Meet, Google Classroom, etc.
- (ii) Outline **one** advantage and **one** disadvantage of using video conferencing in education.
Advantage: Facilitates out of classroom learning, remote parent-teacher meetings, etc.
Disadvantage: Broadband connectivity issues, loss in face-to-face experience, etc.

(10 marks, 4+6)

- 3(b) (i) Using notes and annotated sketches, describe the difference between a star topography and a ring topography.

Star topography- the nodes are connected to a central hub or router through which the data travels to all the nodes.

Ring topography- the nodes are connected to each other completely via a dedicated link.



- (ii) Describe **two** advantages of networking a computer system.
Access from anywhere, server used to save data, sharing information, etc.
- (iii) Outline **two** benefits of using a tablet over a desktop computer in the workplace.
More portable, faster, less space required, etc.

(20 Marks, 6+8+6)

Answer 3(c) or 3(d)

- 3(c) (i) Briefly outline **one** example of a cybercrime.
Any relevant example, e.g., email and internet fraud, theft of card payment data.
- (ii) Describe what you understand by the term Cryptocurrency.
Cryptocurrencies are digital assets created using computer networking software that enables secure trading and ownership. Bitcoin and most other cryptocurrencies are supported by a technology known as blockchain, which maintains a tamper-resistant record of transactions and keeps track of who owns what.

(10 Marks, 4+6)

OR

- 3(d) (i) Outline **two** benefits of using fibre optic cable instead of copper cable for data transfer.
Better signal, lighter, etc.
- (ii) Describe what is meant by the term *encryption* when referring to data storage.
The process of converting information into code, to prevent unauthorised access to the data, etc.

(10 Marks, 4+6)

Option 4 - Manufacturing Systems

(a) - 10 marks, (b) - 20 marks, (c) OR (d) - 10 marks

Answer 4(a) and 4(b)

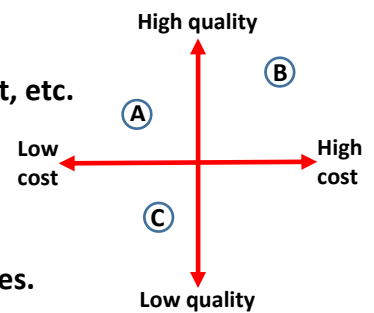
- 4(a) (i) Outline **two** reasons why a company might gather information about products using this technique.
Better understand perceptions of products, visually effective, fast, etc.

- (ii) Using the diagram shown, briefly describe the characteristics of **any two** of the products labelled A, B, or C.

A- Low cost/high quality, likely to sell.

B- High cost/high quality, likely to sell but cost could impede sales.

C- Low cost/low quality, poor sales likely as a result



(10 marks, 4+6)

- 4(b) (i) Explain the manufacturing term Assembled-to-Order.
The product is put together once it's ordered by the customer.
- (ii) Suggest **two** advantages of using this method of producing bicycles.
Less stock, meet individual needs, etc.
- (iii) Outline **one** other product that could be assembled-to-order and explain why this method is suitable for this product.
Computers, cakes, etc. Valid justification.

(20 Marks, 6+8+6)

Answer 4(c) or 4(d)

- 4(c) (i) Outline **two** reasons why tests are carried out on bicycles before they are sold to customers.
To ensure that they are fit-for-purpose, determine the warranty period, etc.
- (ii) Briefly outline a fault (effect) that might be identified by the testing of a bicycle and suggest a potential cause.
Effect- Failure of brake system, Cause- broken brake cable.
Any relevant effect and cause identified.



(10 marks, 4+6)

OR

- 4(d) (i) Outline **two** ways a bicycle could be designed so that it can be easily recycled.
Semi-permanent jointing methods used to disassemble parts of the bicycle, use recyclable materials in its manufacture, etc.
- (ii) Suggest **two** consequences for the environment of a poorly designed product at its end of life.
More products sent to landfill sites, waste of materials, further consumption of earth's natural resources, etc.

(10 marks, 4+6)

Option 5 – Materials Technology

(a) - 10 marks, (b) - 20 marks, (c) OR (d) - 10 marks

Answer 5(a) and 5(b)

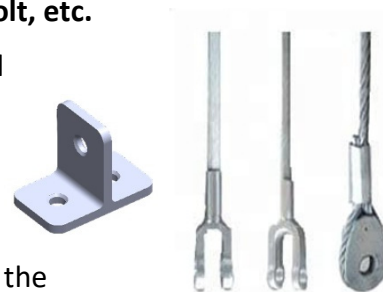
- 5(a) (i) Suggest **two** reasons why steel is an appropriate material for the manufacture of the suspension cables of the bridge.
Strong in tension, can flex without fracturing, etc.
- (ii) Steel is an example of an *alloy*.
Briefly describe what is meant by the term alloy when referring to materials.
An alloy consists of two or more materials combined to produce a new material with different properties to its constituent materials.

(10 marks, 4+6)

- 5(b) (i) Briefly outline, with an example in **each** case, the difference between permanent and semi-permanent jointing methods.
Permanent joints cannot be dismantled without braking, e.g., a welded joint.
A semi-permanent joint can be dismantled, e.g., nut and bolt, etc.

- (ii) Using notes and annotated sketches, describe how a vertical suspending cable could be attached to the concrete deck using a bracket like that shown.

A cable (wire rope) sling could be attached using a heavy duty nut and bolt assembly, etc.



- (iii) Suggest **two** safety hazards workers could encounter during the construction of a large-scale project such as a suspension bridge.
Fall from a height, struck by heavy materials/machinery during construction, etc.

(20 Marks, 6+8+6)

Answer 5(c) or 5(d)

- 5(c) (i) Describe what is meant by the term galvanising.
Applying Zinc to surface protect the material from rust.
- (ii) Briefly outline **one** alternative method of protecting a named material of your choice from environmental degradation.
Wood- apply paint/varnish, etc.

(10 arks, 4+6)

OR

- 5(d) (i) In the case of **any two** materials listed above, give **one** application of where each is used in everyday life.

Lithium- rechargeable batteries for mobile phones,
Cobalt- artificial joint replacements/clothing fasteners,
Natural rubber- surgical gloves, car tyres, etc.



- (ii) Suggest **two** reasons why the availability of some raw materials are becoming critical worldwide.
Limited availability, excessive use, waste of materials, etc.

(10 marks, 4+6)



Leaving Certificate Examination, 2023

Technology

Coursework Briefs

Ordinary Level and Higher Level

200 marks

The Thematic Briefs for the Leaving Certificate Examination 2023 are given overleaf.

The Coursework must be available for assessment by Friday 31 March 2023.

Leaving Certificate Technology

Ordinary Level and Higher Level 2023

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. When using research sources, including the Internet, the sources **must be acknowledged**. Research material copied directly from the Internet or from other sources and presented as your own work will not receive any marks.
8. The coursework should display knowledge and skills developed through your study of the core and chosen options.
9. All important operating features of the artefact must be clearly visible and be easily accessible without dismantling.
10. 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.
11. 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.

The coursework must be available for assessment by Friday 31 March 2023.

Leaving Certificate 2023 - Ordinary Level

Thematic Brief

Efficient airport operations are important in the global transport system. Airport operations can be strained by the increasing number of flights and passengers while trying to maintain punctuality, performance, and safety.

Technology plays a significant role in the day-to-day management of airport operations. Modern airports use technology in areas such as: access to terminal buildings or waiting areas, security, luggage handling and loading, passenger information, safety considerations, and the management of aircraft at parking gates and on runways.

In this context, design and make a working model of a device, system, or technological aid that could be used to assist an aspect of an airport's operation. 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. 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.*

