



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2019

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.



Leaving Certificate Examination, 2019

Technology

Ordinary Level

Marking Scheme

Section A - Core (72 marks)

Instructions:

- (a) Answer **any nine** of the twelve questions in the spaces provided.
All questions in Section A carry 8 marks.

Section A. Answer **any nine** questions. All questions carry 8 marks.

1. The graphic shows a safety sign that is often displayed in Technology classrooms.

(i) State the meaning of this safety sign.

Ear protection must be worn by the user.

(ii) Safety signs are classified according to colour.

Explain what is meant by safety signs that are **blue** in colour.

A safety sign that is blue in colour indicates a mandatory instruction.



(4+4 marks)

2. A BER (Building Energy Rating) certificate is an indication of the energy performance of a home.

(i) Give **two** benefits of having an 'A' rated home.

1. **Lower ongoing energy costs.**
2. **Better for the environment, higher market value for the house, etc.**

(ii) Describe **one** way in which the BER of an older home could be improved.

Increase the Insulation in the house, upgrade windows and doors, upgrade heating systems/controls, etc.



(4+4 marks)

3. The image shows a project that is made from *Live Edge* or *Light Gathering* acrylic.

(i) Suggest **one** advantage of using this type of acrylic for the manufacture of this project.

The material allows light to enhance the edge profile of the project.

(ii) State **two** processes undertaken when finishing the edge of an acrylic sheet which has been cut with a saw.

1. **Cross filing/draw filing**
2. **Polishing, etc.**



(4+4 marks)

4. For car manufacturers, driverless cars will shape their future manufacturing strategies.

(i) Give **two** reasons why car manufacturers are developing driverless cars.

1. **Safety of passengers**

2. **Technological advancements, marketing, etc.**

(ii) Give **one** technological advancement which enables the development of driverless cars.

Radar sensors monitoring other cars nearby, GPS, video cameras, onboard computer systems, etc.



(4+4 marks)

5. On September 6th 2018, the Walney Extension became the world's largest offshore wind farm, covering 145 km² with 87 turbines.

(i) Give **one** advantage of offshore wind farms.

Less intrusive on communities, generally greater wind speeds can be achieved, etc.



(ii) State **two** energy conversions that take place in a wind turbine.

Conversion 1: **Kinetic to mechanical**

Conversion 2: **Mechanical to electrical, etc**

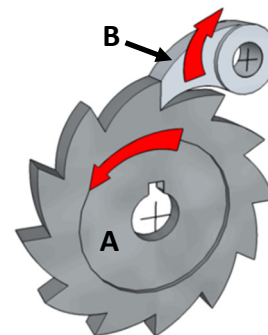
(4+4 marks)

6. The graphic shows a mechanism which consists of two parts, labelled A and B.

(i) Name component A and component B.

Component A: **Ratchet**

Component B: **Pawl**

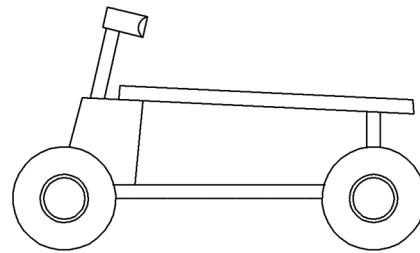


(ii) Outline **one** practical application of the mechanism shown.

Wire tensioner for fencing/netting behind GAA goal posts, clothes line etc.

(4+4 marks)

7. The image shows a push-car for a child, designed and manufactured by the Swiss designer Wolfgang Sirch. In the box provided, make a well proportioned 2D sketch of the push-car when viewed in the direction of arrow **A**.



(Very good sketch - 8 marks
Fair sketch - 4 marks)

8. *Universal Design* is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.

State **two** ways in which the walkway shown has taken the principles of Universal Design into consideration.

1. **The wide walkway is wheelchair accessible**
2. **Hand rail suitable for multiple users, pathway is colour coded for individuals who may be visually impaired, etc.**



(4+4 marks)

9. The image shows a combined table and magazine rack made from plywood.

(i) Suggest **two** reasons why plywood is a suitable material for the manufacture of this product.

1. **High strength/stability**
2. **Flexibility, etc.**

(ii) Name **two** other manufactured boards commonly used in the manufacture of furniture.

1. **Chipboard**
2. **Veneered MDF, etc.**



(4+4 marks)

10. The image opposite shows a desktop computer system.

Explain, with **one** example in **each** case, what is meant by the terms *hardware* and *software* when referring to a computer system.



Hardware: **Physical components, i.e., motherboard, CPU, monitor, keyboard, mouse, etc.**

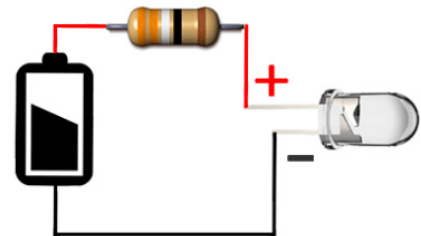
Software: **Systems/Application Programs– Operating Systems, file management utilities, word processing, etc.**

(4+4 marks)

11. The graphic shows a Light Emitting Diode (LED), a resistor and battery connected in series in a circuit.

(i) What is the name for the positive leg of an LED?

Anode



(ii) The voltage (V) of the battery shown is 6 V. The voltage drop (V_f) required across the LED is 2 V and the maximum current (I_f) the LED can draw is 0.02 A. Calculate the minimum value of the resistor (R) required to protect the LED.

Note: $R = \frac{V - V_f}{I_f}$

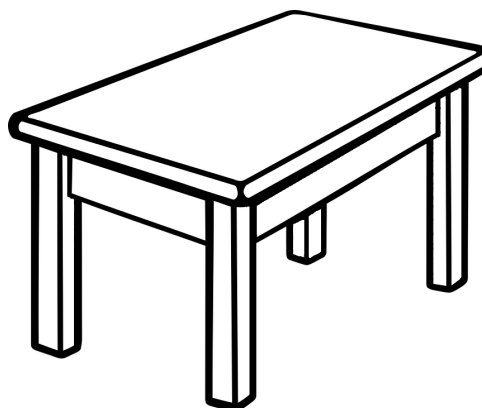
Calculation:

$$\frac{6V - 2V}{0.02} = \frac{4V}{0.02} = 200 \Omega$$

(4+4 marks)

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

Rendering, colour, shadow, hatching, etc.



(4+4 marks)

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Leaving Certificate Examination, 2019

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Marking Scheme

Section B - Core

(48 marks)

Answer **both** questions.

Each question in Section B carries 24 marks.

Section C - Options

(80 marks)

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

All questions in Section C carry 40 marks.

Section B - Core *Answer Question 2 and Question 3.*

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

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

- 2(a)** (i) Explain what is meant by the term CAD.
Computer Aided Design– software used by engineers/architects for design purposes, etc.
- (ii) The housing is to be manufactured using a CAM process such as 3D printing.
 Give **two** advantages of using a CAM process to manufacture the housing.
Accuracy, efficiency, high quality of manufacture, etc.

(10 Marks, 6+4)

2(b) The temperature sensor circuit to be incorporated into the alarm is shown in the graphic.

- (i) Using your *Formulae and Tables* booklet or otherwise, name component A.

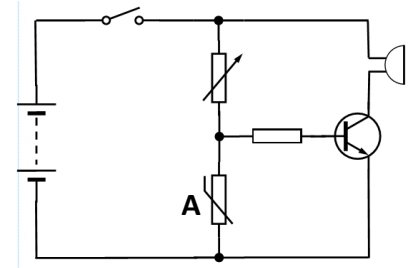
Thermistor.

- (ii) Briefly describe the operation of this circuit.

When the switch is closed current flows through the circuit. When it is cold, the thermistor has high resistance and current flows to turn on the transistor. With the transistor turned on, the buzzer will sound. The variable resistor allows the sensitivity of the circuit to be adjusted.

- (iii) Describe **one** other application for a temperature sensor circuit.

Any relevant example with description– Frost alarm, refrigeration, oven, etc.



Answer 2(c) or 2(d)

(8 Marks, 2+4+2)

- 2(c)** (i) Briefly outline **any two** stages of the Deming Cycle.

Plan– identify problems

Do– test potential solutions

Study- consider/examine the findings

Act– implement the best solution.

- (ii) Outline **two** consequences for a company that manufactures faulty goods.

Repair/replace costs, damage to reputation, potential lawsuits, etc.

(6 Marks, 4+2)

OR

- 2(d)** (i) In the case of **any two** adhesives named above, describe how they should be used when joining materials together.

Epoxy resin– **mix the required amount of the resin and the hardener together to initiate the curing process. Apply the mixed adhesive to the surfaces of the materials to be joined together.**

Impact adhesive– **apply adhesive to the surfaces of both materials to be joined together. Only when the adhesive is touch dry, join both surfaces together.**

Liquid solvent cement– **use an applicator and apply the cement to the joint line between the pieces of acrylic being joined together. The bond sets in a short period of time.**

PVA glue– **apply adhesive to the surfaces to be joined together. Apply pressure to both surfaces until the adhesive is cured.**

- (ii) Outline **two** safety precautions to be observed when using adhesives.

Use glue stick/applicator so as to avoid skin contact, ventilation, etc.

(6 Marks, 4+2)

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

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

- 3(a)** (i) Outline **two** benefits of using virtual technology for educational purposes.

VR can help students easily understand complex concepts, suitable for different learning styles, students can access content that may not be readily available otherwise, enjoyable/innovative, etc.

- (ii) Give **two** other applications of virtual technology in society.

Gaming, VR simulations in health care/transport, shopping– virtual tours of a store, etc.

(10 Marks, 6+4)

- 3(b)** (i) Name a suitable material for the manufacture of part A. Justify your answer.

Any relevant material justified, e.g., PVC rigid foamboard– light weight, range of colours, etc.

- (ii) Suggest **two** important considerations to be considered when designing the VR viewer to ensure that it is fit for purpose.

Anthropometric measurements–e.g., position of eye and nose cut-outs, compartment to hold the phone, assembly methods for the parts, etc.

- (iii) Using notes and sketches, briefly describe how a VR viewer could be manufactured in a Technology classroom.

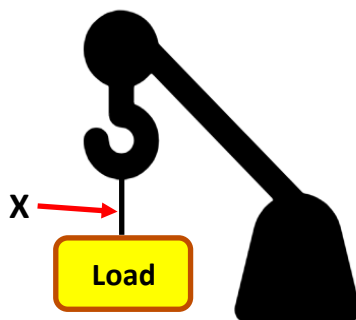
Any relevant process described, e.g., using CAD/CAM, etc.



(8 Marks, 2+2+4)

Answer 3(c) or 3(d)

- 3(c)** The graphic shows a crane lifting a load.



- (i) Name the force acting on cable X lifting the load.

Tension.

- (ii) Calculate the power if the work done by the crane is 18,000 Joules in 6 seconds.

Note: Power = work/time

$$\text{Power} = 18,000/6 = 3,000 \text{ Joules}$$

(6 Marks, 2+4)

OR

- 3(d)** (i) Give **two** factors that contribute to the global rise in greenhouse gas emissions.

Burning of fossil fuels for power/heat/transport, agricultural production, over consumption in society in general, etc.

- (ii) Suggest **two** ways technology can be used to protect our environment.

Focus on using sustainable processes/materials, use renewable sources of energy, smarter homes, environmental monitoring, use electric cars, etc.



(6 Marks, 2+4)

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

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

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

1(a)

- Suggest **two** advantages of using an automated milking parlour.
Milk production can be monitored, sensors ensure the parlour is very safe for farmers and livestock, less labour intensive, etc.
- Briefly outline **two** other applications of RFID technology.
Track the progress of production of an automobile on an assembly line, track and manage inventory, assets, people, etc.

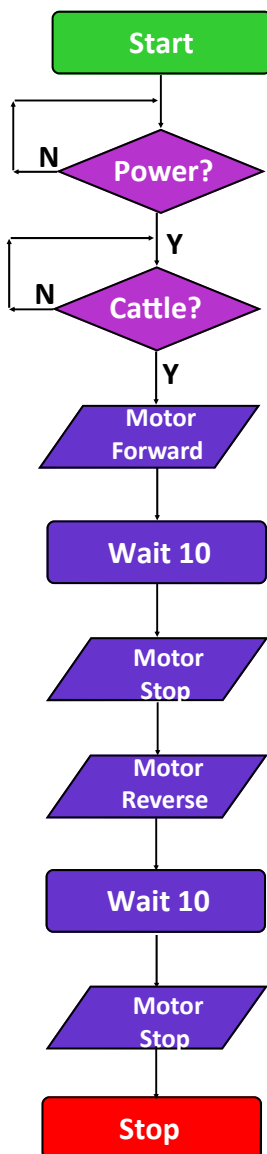


(10 Marks, 6+4)

1(b) The image shows a gate system which moves cattle from a holding area into a milking parlour. A student is making a model of this system and is designing a flowchart to control its operation.

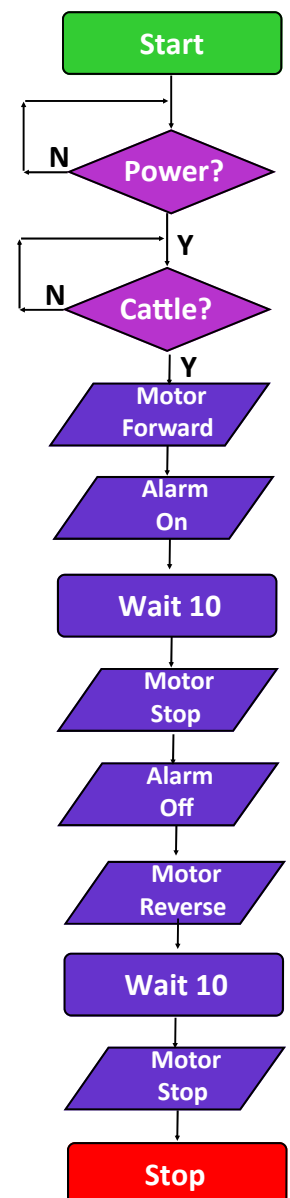


- Complete the flowchart to operate the gate in the following sequence:



- Suggest a modification to the flowchart to sound an alarm while the gate is moving forward.

Any valid alternative solution accepted.



- Name a suitable sensor that could be used to detect that a cow has entered the holding area.
Infrared, motion, pressure switch, etc.

(20 Marks, 8+6+6)

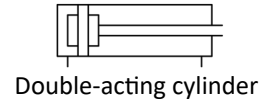
Answer 1(c) or 1(d)

1(c) The graphics show the pneumatic symbols for a double-acting cylinder (actuator) and for a throttle valve.

- (i) Explain how a double-acting cylinder works with reference to the graphic given.

The double acting cylinder has a port at each end.

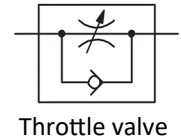
The piston moves forward and back by alternating the port that receives the high pressure air.



- (ii) Give **one** advantage to using a throttle valve in conjunction with a double-acting cylinder.

A throttle valve can be used to regulate the flow of air (speed) in one direction.

This allows for the operation of the piston to be controlled.



(10 Marks, 6+4)

OR

1(d) Medical and surgical robots have become increasingly popular in recent years.

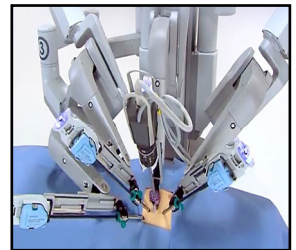
- (i) Give **one** advantage and **one** disadvantage of using robotic devices for surgery.

Advantage: Precision/accuracy, speed, human error greatly reduced, etc.

Disadvantage: Loss in employment opportunities for staff

- (ii) Describe what is meant by the term *end effector* when referring to robots such as the surgical robot shown.

An end effector is an attachment at the end of the robotic arm. Examples include mechanical gripper, drill, spray gun, etc.



(10 Marks, 6+4)

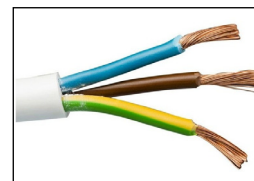
Option 2 - Electronics and Control - Answer 2(a) and 2(b)

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

- 2(a) (i) With reference to the cable shown, explain the difference between a conductor and an insulator.

A conductor allows current to flow freely through it, e.g., copper wire.

An insulator prevents the current from flowing freely, e.g., plastic insulation around a copper wire.



- (ii) State the colour of the *live* wire and the colour of the *neutral* wire in a cable shown.

Live: Brown, Neutral: Blue.

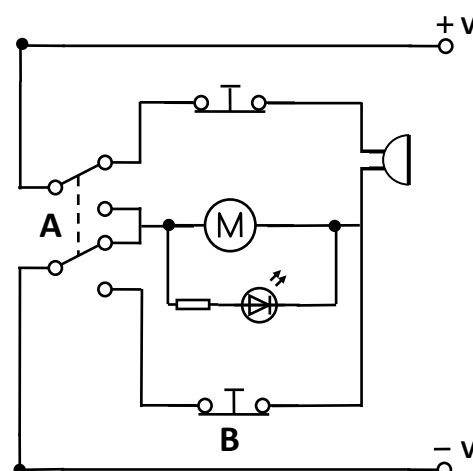
(10 Marks, 6+4)

- 2 (b) (i) Name switch A and switch B.
**A: Double Pole Double Throw (DPDT),
B: Push-to-break (PTB)**

- (ii) Modified circuit shown.

- (iii) An LED is a polarised component.
State **two** ways of identifying the cathode of an LED.

**Cathode identification: Shorter pin,
pin nearest the flat edge of the LED,
use a multi-meter to determine polarity.**



(20 Marks, 6+8+6)

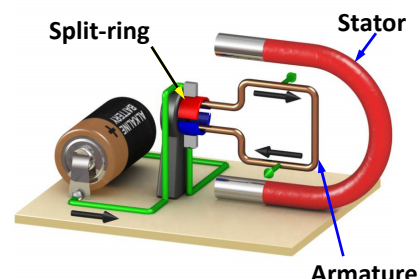
Answer 2(c) or 2(d)

- 2(c) (i) Explain what is meant by the abbreviation DC when referring to a motor.

DC: Direct Current

- (ii) With reference to the image opposite briefly outline the principle of operation of a DC motor.

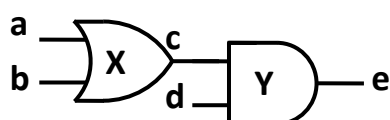
When the battery provides current to the armature, a magnetic field is generated. As the armature is positioned within the magnetic field of the permanent magnet (Stator), the armature experiences a force described by the left hand rule. This interplay of magnetic fields and moving charged particles (the electrons in the current) results in the torque that makes the armature spin. The split-ring commutator is required to ensure that the armature continues to spin in the right direction and at the right time.



(10 Marks, 6+4)

OR

- 2(d) The graphic shows a logic circuit.



- (i) Name the logic gates at X and Y.
X: OR gate, Y: AND gate

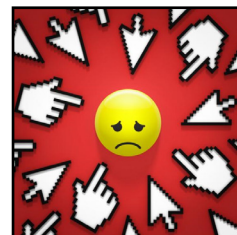
- (ii) Determine values for A, B, C and D in order to achieve a final output of 1 at E.

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

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

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

- 3(a)** (i) Suggest **two** ways of minimising the risk of cyberbullying.
Careful use, not friending people you don't know, don't respond, etc.
- (ii) Give **one** example of Internet fraud and suggest **one** way to guard against it.
Phishing. Be vigilant of improper email addresses/false URLs, install anti-virus/security suite products, etc.



(10 Marks, 6+4)

- 3(b)** (i) Explain what is meant by the term USB?
A Universal Serial Bus (USB) is a common interface that enables communication between PCs, peripheral devices, media devices, external hard drives, printers, etc.
- (ii) Discuss **any two** benefits outlined at **3(b)** above in relation to USB Type-C.
High-bandwidth data transfer– up to double the transfer speed of USB 3 at 10 Gbps
video output– with increased data-transfer speeds comes the ability to push video over the same connection.
charging - can carry more power, so they can be used to charge larger devices like laptops
symmetrical in design– as its reversable, it's easier to plug in to a device.
- (iii) Name **two** computing devices that would benefit from the use of this type of connector.
Storage devices, notebooks, docking station, tablet computers, smartphones, etc.

(20 Marks, 8+6+6)

Answer 3(c) or 3(d)

- 3(c)** (i) Describe **two** computing services that are available through cloud computing.
Data storage, shared software, platform services, etc.
- (ii) Outline a reason why cloud computing might **not** be a good option in some circumstances.
Security of data, cost of subscription, access to internet, etc.



(10 Marks, 6+4)

OR

- 3(d)** (i) Briefly outline why an end-user might need to purchase a license in order to use a software program.
A license gives an end-user permission to use the software legally without copyright infringement, etc.
- (ii) *Individual, multi-user or site licences can be used in schools.*
- Briefly outline the reasons why it may be necessary in a school to have **any two** of these licence types.
- Individual– only a need for one license, e.g., CAD/CAM software license**
Multi-user– only a need for a specific number of licenses, e.g., 10 user circuit wizard license.
Site License– many users need to use this license, e.g., Microsoft office for every student in a school

(10 Marks, 4+6)

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

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

4(a)

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

Benchmarking is a process of measuring a company's products, services or processes against those of a competitor business, considered to be the best in the industry



- (ii) Suggest **two** improvements that could be made to the packaging of grapes shown in the image.

Labelling, choice of materials for packaging, design of packaging, etc.

(10 Marks, 6+4)

4(b)

- (i) Briefly outline how the 'equipment used' can impact on a manufacturing process.

Greater reliability in manufacturing is likely to be achieved when higher quality equipment is used, equipment to be used needs to be fit for purpose, etc.

- (ii) Give **two** reasons why customer feedback might be gathered by a production company.

Performance of manufacturing processes, identify customer needs, analysis on the quality of a product, etc.

- (iii) Outline **one** way in which a company might seek to add value to a product.

Use higher grade raw materials, improve packaging design, increasing the cost of a product can give a perception of a higher quality product, etc.

(20 Marks, 8+6+6)

Answer 4(c) or 4(d)

4(c)

- (i) Briefly describe **two** ways of promoting effective teamwork in an organisation.

Greater collaboration, clarity with roles/responsibilities for employees, effective communication, incentives for productivity, etc.



- (ii) Outline **two** benefits for a company when employees work effectively.

Increased profits, less conflict/complaints from employees, improvement in a company's reputation, etc.

(10 Marks, 6+4)

OR

4(d)

- (i) Outline **one** way a company could increase its capacity in response to an increased demand for its products.

Hold raw materials in reserve, increase the production of a product, hire additional employees, etc.

- (ii) Outline **two** consequences for a company that regularly fails to meet the demand for its products.

Loss in profits, loss in reputation, potential lawsuits, etc.

(10 Marks, 6+4)

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

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

- 5(a)** (i) Explain what is meant by the term 'semi-permanent' when referring to jointing methods.
Semi-permanent joints can be dismantled to allow the joined parts to be separated without being damaged.

- (ii) Name **two** semi-permanent methods commonly used in project manufacture in Technology classrooms.

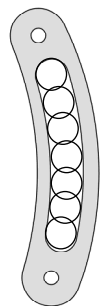
Examples include nut and bolt, screws, knock down fittings, etc.

(10 Marks, 6+4)

- 5(b)** The wheelchair is made from moulded plastic and aluminium.

- (i) Suggest why moulded plastic and aluminium might be used to manufacture the wheelchair.
Moulded plastic: versatile shapes can be produced, efficient use of material, strong, etc.
Aluminium: lightweight, corrosion resistant, recyclable, etc.

- (ii) Using notes and/or sketches, describe how the curved metal linkage **A** could be manufactured in a school workshop.
Mark out the linkage, drill assembly holes, remove slot by drilling a series of holes/filing to the curve, shape outside curve by cutting with a hack saw and filing to the curve, Any similar process described.



- (iii) VelcroTM is a synthetic fabric which is also used in the manufacture of this product.

Name **two** other fabrics that might be used in the manufacture of this product.

Cotton, Nylon, Polyester, etc.

(20 Marks, 8+8+4)

Answer 5(c) or 5(d)

- 5(c)** (i) Discuss why it is important to consider how a product is disposed of once it reaches its end-of-life.
Protect the environment, protect the health of people and wildlife, consider reuse or recycling options, etc.

- (ii) Briefly outline **two** options available when disposing of a product such as the dog wheelchair above.

Upcycle the moulded plastic to create a new product, reuse the wheels, melt down the aluminium for reuse, recycle/reuse nuts and bolts/screws, incineration only when necessary, etc.

(10 Marks, 6+4)

OR

- 5(d)** The image shows samples of chipboard, like that often used for furniture. Each chipboard panel has a *veneer* applied to its surface.

- (i) Describe what is meant by the term 'veneer' when referring to materials.

A thin decorative layer of wood (or plastic) that is applied to a coarser product such as chipboard, MDF, etc.

- (ii) Briefly outline **two** reasons why manufactured boards are often used instead of solid wood in furniture production.

Cheaper, less use of hardwoods, desired properties such as stability, strength, etc.

(10 Marks, 6+4)

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Leaving Certificate Examination, 2019

Technology

Coursework Briefs

Ordinary Level and Higher Level

200 marks

The Thematic Briefs for the Leaving Certificate Examination 2019 are given overleaf.

The Coursework must be available for assessment by Friday 29 March 2019.

Leaving Certificate Technology

Ordinary Level and Higher Level 2019

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 29 March 2019.

Leaving Certificate 2019 - Ordinary Level

Thematic Brief

Weather events can be unexpected, unusual, unseasonal or even severe in nature. In recent years more locations are experiencing extreme weather events for the first time. The impact weather has on our lives is far-reaching. It can influence the clothing we wear, the activities we plan, the travel arrangements we make and the precautions taken to deal with extreme weather conditions.

Technologies can play a useful role when dealing with weather. They can assist in monitoring, forecasting, activating alert systems, and in helping to protect lives, livelihoods and property.

In this context, design and make a working model of a device, system or aid beneficial when responding to a weather event in a context of your choice.

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.*

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