



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2018

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, 2018

Technology

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Marking Scheme

Section A - Core (72 marks)

Instructions:

- (a) Answer **any nine** 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 for an item of *PPE* commonly used in workshops.

(i) Explain what is meant by the abbreviation PPE when referring to safety.

Personal Protection Equipment, etc.



(ii) Suggest **two** occasions when a person may be required to wear the item of PPE shown in the safety sign.

Processing a material, applying a finish to a material, assembly of parts, etc.

(4+4 marks)

2. A German based company have created an intelligent natural air purifier; the *CityTree*, to deal with urban air pollution. One CityTree can have the purifying effect of 275 trees.

Give **two** main causes of air pollution in cities.

Motor vehicles, Industrial manufacturing facilities, burning fossil fuels (coal, oil, gas) in homes, etc.



State **two** advantages of using the CityTree shown.

Helps to purify air pollution, less space required compared to trees, creates employment, etc.

(4+4 marks)

3. *3D printing*, which is an application of CAD/CAM, has become very popular in industrial and educational settings.

Give **two** benefits of using a 3D printer to manufacture a product.

Additive manufacturing allows for cost savings to be made (no wastage) compared to traditional machining, speed of production, custom/bespoke parts can be manufactured, safe, etc.



(4+4 marks)

4. The image shows a case to hold four AA cells connected *in series*.

- (i) Explain what is meant by 'in series' when connecting AA cells.

When AA cells are connected in series, the combined voltage is the sum of the individual voltages, e.g. $4 \times 1.5V = 6V$.



- (ii) Many components used in Technology projects are *polarised*. Name **two** polarised components used in electronic circuits.

Light Emitting Diode (LED), Capacitor, Diode, Buzzer, etc.

(4+4 marks)

5. Customers consider many factors when purchasing a mobile phone. These factors can include cost, reliability, access to apps and the *operating system* of the phone.



- (i) What is the function of an operating system on a mobile phone?

This software manages the operation of the phone— memory, processes, hardware and software. It enables a user to interact with various apps through its interface, etc.

- (ii) Name **two** operating systems used in modern mobile phones.

IOS, Android, Windows, etc.

(4+4 marks)

6. A WBS can be used by a Project Manager to oversee the building of a large scale project.

- (i) Explain what is meant by the abbreviation WBS.

Work Breakdown Structure.



- (ii) Outline **two** ways in which a WBS helps ensure that a task is completed on time.

Provides a visual understanding of the sequence of tasks to be completed, outlining the start and finishing times for each task also helps to ensure a project is completed on time, etc.

(4+4 marks)

7. In the box provided, make a well proportioned **2D** sketch of the bench shown when viewed in the direction of the arrow **A**.



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

8. Domestic electricity usage is measured in **kWh**.

- (i) Explain what is meant by the abbreviation kWh.

kiloWatt Hour

- (ii) In one month, a customer uses 550 units of electricity at a cost of 17.50 cent/kWh. Calculate the total bill for the month, including a standing charge of €19.75.

$$550 \times 0.175 = \text{€}96.25 + \text{€}19.75 = \text{€}116$$



(4+4 marks)

9. The graphic shows a bingo machine consisting of spherical drum and a *wooden stand*.

List **four** main steps required to manufacture the wooden stand.



1. Marking out of parts.

2. Drilling.

3. Shaping.

4. Assembly, etc.

(4x2 marks)

- 10.** The graphic shows a bridge over the new M17/M18 motorway in Co. Galway. *Triangulation* was used in the construction of the bridge.



- (i) Outline what is meant by the term triangulation.

**Creating structures using triangles in its design.
This makes the structure very strong and rigid.**

- (ii) Give **two** reasons why modern bridges can span longer distances.

Advances in modern materials, better design of bridges using CAD and simulation software, etc.

(4+4 marks)

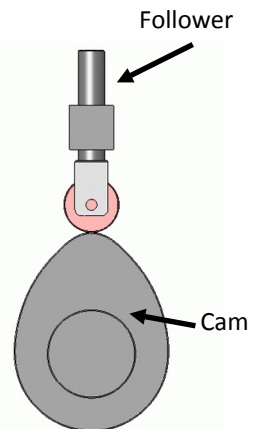
- 11.** The image shows a Cam and Follower mechanism. As the cam rotates the follower *reciprocates*.

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

Straight line motion in both alternate directions.

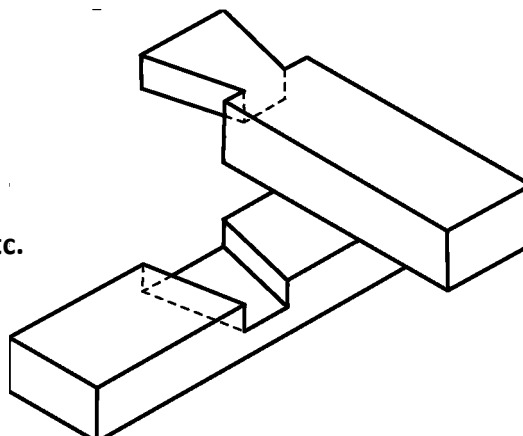
- (ii) Give **one** application of this mechanism in everyday life.

Educational toys, engine valves, etc.



(4+4 marks)

- 12.** The graphic shows a dovetail halving joint made from softwood. Use **two** graphic techniques to enhance the representation of the joint.



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

(4+4 marks)

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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 options 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) The graphic shows two heavy-duty wheelbarrows - both constructed to be durable. The pan, which is an most important element of any wheelbarrow, is made from heavy-gauge high density polyethylene (HDPE).

(i) Outline **two** advantages of making the pan from plastic.

Easy to mould, tough, durable, light, etc.

(ii) Suggest **one** benefit of having two wheels at the front of a wheelbarrow.

Greater balance, better load distribution, safer to use, etc.

(10 Marks, 6+4)



2(b) The hardwood handle of the wheelbarrow has a company name and logo applied.

(i) Give **two** reasons why a company applies a logo to its products.

To sell products, promote a brand, etc.

(ii) Suggest **two** considerations a company could have when designing its logo.

Size and placement of logo, style, application of logo to surfaces, patent rights, etc.

(iii) Using notes and annotated sketches, briefly describe how a student might apply a logo to a piece of hardwood.

Applied using CAD/CAM technology such as using a laser machine or vinyl cutter, logo applied using a pyrography machine and carbon paper, etc.

(8 Marks, 2+2+4)



Answer 2(c) or 2(d)

2(c) The wheelbarrow is primarily assembled using *semi-permanent* joints.



(i) Explain what is meant by semi-permanent when referring to jointing methods.

Parts can be assembled and disassembled as required.

This type of jointing method is useful if a part needs to be repaired, replaced, etc.

(ii) Name **two** semi-permanent joints commonly used when manufacturing technology projects.

Nuts and bolts, screws, knock down fittings, etc.

(6 Marks, 2+4)

OR

2(d) The wheelbarrow manufacturer states that their wheelbarrow handles are made from *sustainable* hardwoods.

(i) Briefly outline why hardwoods may be a more environmentally friendly choice than using plastics to manufacture the handles.

Sustainable and renewable material, trees reduce air pollution, etc.

(ii) Suggest **two** other ways students can be mindful of the environment when manufacturing a project.

Greater focus on design, reduce size of projects, less wastage, energy considerations when manufacturing, etc.



(6 Marks, 2+4)

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

3(a) A desk lamp, such as the one shown, is to be manufactured with a *plastic* base and a *metal* pole.

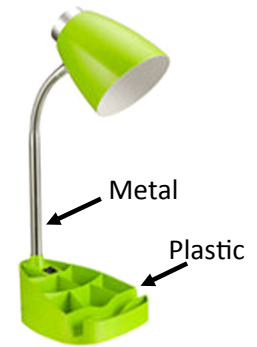
- (i) Name a suitable plastic for the base and a suitable metal for the pole.

Base: PVC, ABS, HIPS, etc.

Pole: chrome plated steel, aluminium alloy, etc.

- (ii) Describe, using annotated sketches, a suitable method for producing the plastic base.

Injection Moulding, Vacuum Forming, etc.



(10 Marks, 4+6)

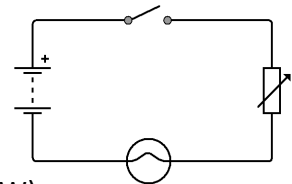
3(b) The image shows a *variable resistor* commonly used in electronic circuits. This component will be used in the lighting circuit for the desk lamp at **3(a)** above.



- (i) Explain the purpose of the variable resistor in the circuit for the desk lamp.

Increase/decrease resistance and in doing so the current flowing through the circuit. This in turn allows the light levels to be varied, etc.

- (ii) Draw a labelled diagram of a suitable circuit for the desk lamp to include a switch, variable resistor, bulb and power supply.



- (iii) An LED light bulb in a circuit has a power rating of 3 watts (W). Calculate the current that the light bulb will draw from a 12V supply.

Note: Power (W) = Current (I) x Voltage (V)

$$3W = I \times 12V, I = 3W/12V = 0.25A$$

(8 Marks, 2+2+4)

Answer 3(c) or 3(d)

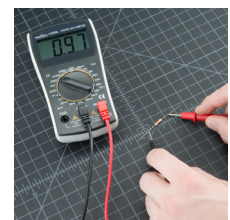
3(c) The diagram shows a *multi-meter*. A digital multi-meter (DMM) is a test tool used to measure electrical quantities.

- (i) Give **two** specific uses of a digital multi-meter in electronics.

Measure current, resistance, voltage, continuity tester, etc.

- (ii) Using notes and annotated sketches, describe how the value of a resistor could be measured using a digital multi-meter.

Select the most appropriate ohm setting on the multi-meter, hold the probes against the resistor legs, take the reading from the multi-meter display, etc.



(6 Marks, 2+4)

OR

3(d) The graphic shows a *prototype* desk lamp manufactured by a lighting company.

- (i) Briefly explain what is meant by a prototype.

The first or original version of a product from which other forms are developed.

- (ii) Outline **two** benefits for a manufacturer who develops a prototype prior to large scale production.

Errors identified and eliminated prior to full scale production, reduced costs, time, develop a better understanding of what the end user wants, etc.,



(6 Marks, 2+4)

Section C - Options - Answer **any two** of the Options

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

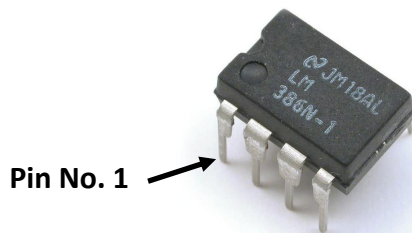
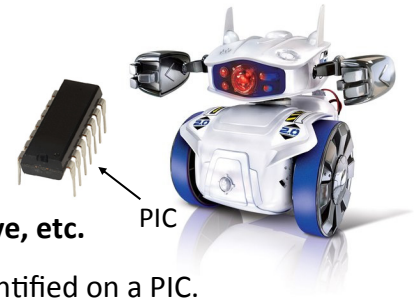
Option 1 - Applied Control Systems - Answer 1(a) and 1(b)

1(a) Many toys use a PIC (Peripheral Interface Controller) in their operation.

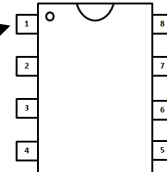
(i) Outline **two** advantages of using a PIC in toys.

Multiple inputs and outputs, reprogrammable, cost effective, etc.

(ii) Explain, using a simple sketch, how pin number 1 can be identified on a PIC.



Pin No. 1

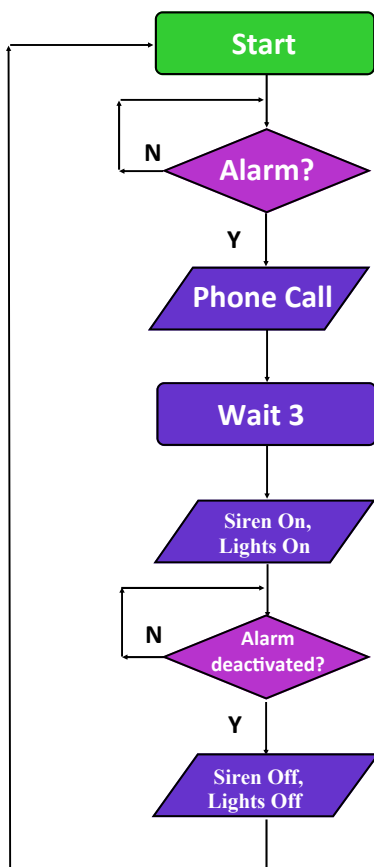


(10 Marks, 6+4)

1(b) Thieves often target shops at night time, when staff have gone home. A student is designing a flowchart for an alarm system that activates if an intruder is detected.

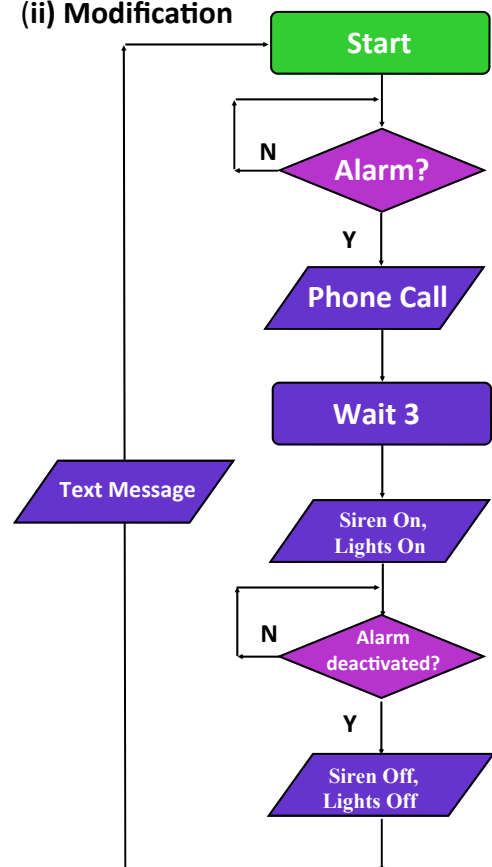


(i) Complete a flowchart for the alarm system using the following sequence:



Any valid alternative solution.

(ii) Modification



(iii) For this alarm system, suggest a suitable sensor to detect the presence of a thief.
Motion detector, LDR, infrared, etc.

(20 Marks, 8+6+6)

Answer 1(c) or 1(d)

1(c) Pneumatic systems are widely used in factories, in production lines and in processing plants. Pneumatics can be used to perform many tasks such as moving, holding or shaping objects.



- (i) Give **two** reasons why pneumatics are used in industry.
Greater speed and control, reliability, cost, etc.
- (ii) Outline **two** specific safety precautions to be observed when using pneumatic systems.
Ensure that the compressor system is in good working order, avoid moving parts, wear PPE such as ear muffs/safety goggles, etc.

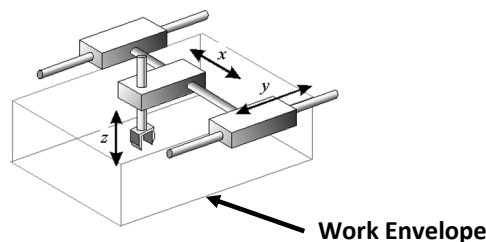
(10 Marks, 6+4)

OR

1(d) The graphics show a moving claw machine with a mechanical gripper for picking up soft toys in an amusement park game. The claw uses a *Cartesian* system of control.

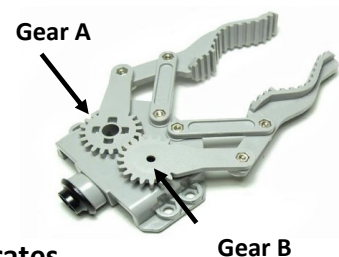
- (i) Explain what is meant by a cartesian system making reference to the *work envelope*.

Three principal axes of control operate at 90° to each other, prismatic joints are used in its operation, rectangular prism work envelope, etc. Popular system used in CNC machines, 3D printing, etc.



- (ii) The claw used in this device is a mechanical gripper. Explain, using sketches, how a mechanical gripper can work.

When a motor rotates gear 'A' in a clockwise direction, its parallel linkage closes the upper jaw. At the same time gear 'B' rotates in an anti-clockwise direction which closes the bottom jaw. The jaws are opened by reversing the direction of the motor, etc.



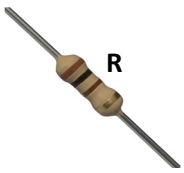
Any relevant sketch showing how a mechanical gripper operates.

(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) A resistor (R) and the resistor colour and tolerance code tables are shown.



- (i) The colour band sequence of **R** is brown, black, brown and gold.
State the value of the resistor **R**.

100Ω (ohms).

- (ii) Calculate the *highest* possible value for the resistor **R** which has a gold tolerance band.

100Ω = 100%, 5Ω = 5% (Gold Tolerance)

100Ω + 5Ω = 105Ω.

(10 Marks, 4+6)

2(b) The graphic shows a 555 timer circuit which is configured in a monostable state.

When the PTM switch is pressed a buzzer will sound for a period of time.

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

Transistor.

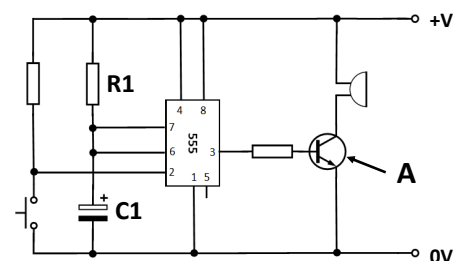
- (ii) Describe how the length of time for which the buzzer sounds can be adjusted in this circuit.

The length of time the buzzer sounds depends upon the values of resistor R1 and capacitor C1.

In general, the larger the values of these components, the longer the buzzer sounds, etc.

- (iii) Give **two** everyday applications for a timer circuit.

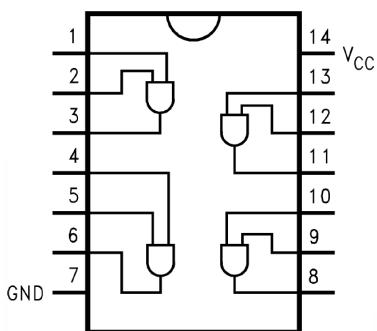
Toy game, egg timer, etc.



(20 Marks, 6+8+6)

Answer 2(c) or 2(d)

2(c) The image shows an IC which incorporates four AND logic gates.



- (i) Explain what is meant by the abbreviation IC when referring to electronic components.

Integrated Circuit.

- (ii) State the pin numbers for the **outputs** of the chip shown.

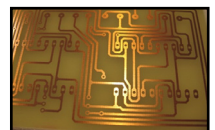
Pins 3, 6, 8 and 11.

(10 Marks, 4+6)

OR

2(d) A student has produced a copper-clad printed circuit board (PCB) using CAD/CAM technology.

- (i) Briefly outline **two** advantages of producing PCBs in a classroom rather than purchasing factory-made PCBs.



Custom PCBs can be manufactured, only manufactured as required, etc.

- (ii) Give **two** safety precautions that should be observed when soldering PCBs.

Use appropriate ventilation, always place soldering iron in holder when not in use, etc.

(10 Marks, 4+6)

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) Briefly explain what is meant by 15GB and 1TB when referring to storage capacity.

15 gigabytes, 1 terabyte. 1 terabyte equals 1000 (or 1024) gigabytes. In terms of storage capacity a high definition movie needs approximately 3-5GB of storage capacity.

- (ii) Give **two** benefits of syncing apps across multiple devices.

An employee can work from multiple places - office/home/on the go, all devices have the latest version of files and programs, syncing can be done automatically, etc.

(10 Marks, 4+6)

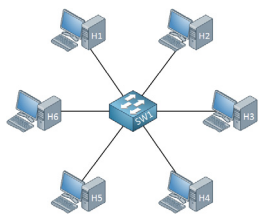
- 3(b)** (i) Describe what is meant by the term Local Area Network.

A computer network that spans a relatively small area such as a single room, building or group of buildings. Each node (individual computer) in a LAN has its own CPU to executes programs, but it also is able to access data and devices anywhere on the LAN. Data can be transferred at a very fast rate, LAN has a limited range in distance, etc.

- (ii) Briefly outline **two** items of hardware and/or software needed to build a typical LAN.

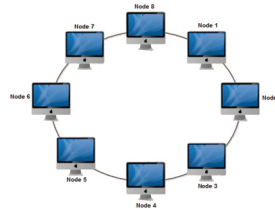
Servers, computers, printers, data storage devices, network adapters, hub/switch/router, ethernet cables, network management software, etc.

- (iii) Using notes and annotated sketches, describe **two** suitable topologies (layouts and structures) for a LAN.



Star topology configuration

Every node connects to a central network device, like a hub, switch, or computer. The central network device acts as a server and the peripheral devices act as clients.



Ring topology configuration

Device connections create a circular data path. Each networked device is connected to two others, like points on a circle. Together, devices in a ring topology are referred to as a ring network.

(20 Marks, 8+6+6)

Answer 3(c) or 3(d)

- 3(c)** (i) Name **two** software programs that would benefit from using a good quality graphics card.
CAD software such as Solidworks, gaming, photo and video editing, etc.

- (ii) Describe the function of the *fan* shown on the graphics card.

To cool the graphics card and prevent it from overheating when in use, etc.

(10 Marks, 4+6)

OR

- 3(d)** (i) Suggest **two** ways in which school management should safeguard the personal or attendance data of students.
Password protection, encryption of data, authorised access only, use of digital technologies such as finger print scanner, facial recognition camera, etc.

- (ii) Suggest **one** intentional and **one** unintentional way in which a person could damage a computer system.

Method explained: Erase information/files, physically damage/destroy computers, install malware, etc.

(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)



An oil painting



A sports club hat



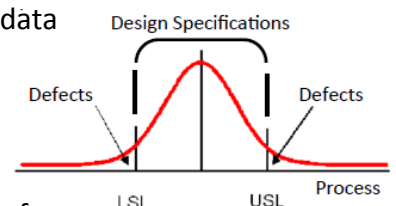
Drinks bottles

- (i) Name a suitable production process for any **two** of the items above.
Oil painting: Once off production, Hat: Batch production, Bottles: Mass production
- (ii) Suggest **two** factors a manufacturer must consider when choosing the most appropriate production process to use for a new product.
Reliability/accuracy/speed of production process, cost, materials used, etc.

(10 Marks, 6+4)

- 4(b) (i) Give **two** reasons why a manufacturer would gather statistical data in relation to a production process.

To better understand its performance, to identify faults, to improve efficiency, etc.



- (ii) With reference to the graphic, briefly outline the consequences for a manufacturer when a process is outside the design specifications.
The process would fail an inspection test and some faulty products would be produced as a result. Customers would look for replacement products or a refund, etc.
- (iii) Process capability can be *greater than, equal to or less than 1*.
Briefly outline what a process capability greater than 1 indicates.
The process is capable – very few, if any defects would be found, etc.

(20 Marks, 8+6+6)

Answer 4(c) or 4(d)

- 4(c) (i) Describe how retailers can improve their corporate responsibility in relation to the environment.
Develop more environmentally sustainable work practices – the design of packaging, reduce/reuse/recycle materials for packaging, production processes, etc.

- (ii) Suggest **two** ways a manufacturer can prolong the production run of a product which is nearing the end of its life cycle.
Retrofit/upgrade parts of the product, ensure the product is maintained, etc.

OR

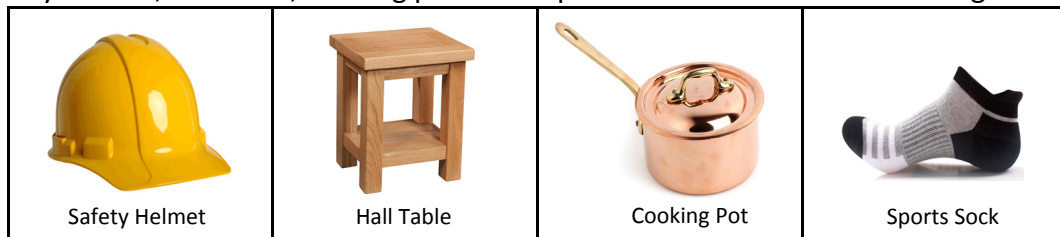
(10 Marks, 4+6)

- 4(d) (i) Discuss the importance of recruiting the best available people to work for a company.
An ability to work with others as part of a team, the need to have the right skill set, e.g - being creative, visionary, to be able to communicate, manage information/time/finance, etc.
- (ii) Give **two** benefits for a company which regularly upskills its employees.
Less human error, greater productivity, better reputation, better staff morale, etc.

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

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

5(a) A safety helmet, hall table, cooking pot and a sports sock are shown in the images.



- (i) Name a specific material suitable to manufacture each item shown above.
Safety Helmet: ABS, Hall Table: Oak, Cooking Pot: Copper, Sports Sock: Cotton, etc.
- (ii) Briefly describe how the handle could be joined to the cooking pot.
A rivet joint could be used to join the handle to the pot, nuts and bolts, etc.



Stainless rivets



Rivet joint

(10 Marks, 4+6)

5(b) The images show a modern folding bicycle. The frame of the bicycle is manufactured using aircraft grade aluminium *alloy*.

- (i) Explain what is meant by the term alloy when referring to metals. Suggest an alternative material for the manufacture of the frame.
An alloy consists of two or more metals mixed together to produce a new material. Typically, when produced alloys have more desirable properties compared to the properties of the individual materials used to make the alloy. Steel Alloy, Carbon Fibre, etc.



- (ii) Give **two** properties of the aluminium alloy which make it a suitable material for the construction of the bicycle frame.

Lightweight, strong, rust proof, etc.



- (iii) Using notes and annotated sketches, suggest a suitable means of allowing the frame of the bike to fold.



A hinge joint would allow both parts of the main frame to fold. A quick release lever could be used to lock/unlock the hinge, etc.

Quick release lever

(20 Marks, 8+6+6)

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

5(c) CNC machines are used in the manufacture of the bicycle.

- (i) Explain what is meant by the abbreviation CNC.

Computer Numerically Controlled.

A CAD file of a part to be manufactured is sent to the CNC machine for production, etc.

- (ii) Outline **two** reasons why manufacturers use CNC machines in the manufacture of products.

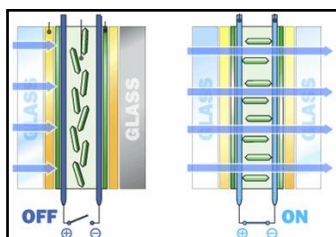
Accuracy, speed, efficiency, safety, etc.



(10 Marks, 4+6)

OR

5(d) Electrochromic glass is a modern *smart material*. It changes its colour and transparency when a small electrical current is passed through it.



- (i) Describe what is meant by the term smart material.
The properties of a smart material can be changed in a controlled fashion by external stimuli, e.g. light, temperature, electricity, etc.
- (ii) Suggest **two** uses of electrochromic glass in everyday life.
Provide privacy for conferences/meetings, controlled lighting/heating in a building, improve energy efficiency of a building, security benefits, etc.

(10 Marks, 6+4)



Leaving Certificate Examination, 2018

Technology

Coursework Briefs

Ordinary Level and Higher Level

200 marks

The Thematic Briefs for the Leaving Certificate Examination 2018 are given overleaf.

The Coursework must be available for assessment by Friday 23 March 2018.

Leaving Certificate Technology

Ordinary Level and Higher Level 2018

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 23 March 2018.

Leaving Certificate 2018 - Ordinary Level

Thematic Brief

A **game of chance** is typically a game where the outcome largely depends on luck but may include some element of skill. Many people enjoy playing versions of such games while socialising with their families and friends.

Examples of items often included in a game of chance are dice, spinning tops, number generators, randomising wheels, or numbered balls drawn from a container such as a lottery machine.

In this context, design and make a working model of a game of chance suitable for use by one or more people in a setting 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 CD 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 as identified by the candidate.	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

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