



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2023

Technology

Section A and Answerbook

Higher Level

Monday 26 June Afternoon 2:00 - 4:30

160 marks

Examination Number

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Day and Month of Birth

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For example, 3rd February
is entered as 0302

Centre Stamp

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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 to 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 twelve questions in this section.
Each question carries 6 marks. |
| Section B | 48 marks
Core – Long-answer questions.
Answer both of the core questions presented.
Each question in Section B carries 24 marks. |
| Section C | 40 marks
Options – Long-answer questions.
Answer one of the five optional questions presented.
Each question in Section C carries 40 marks. |

Section A.

Answer **any twelve** questions. All questions carry 6 marks.

Write your answers in the spaces provided.

1. In 2021, five 'Robot City Trees' were installed in Cork city centre. The trees use *IoT* technology and natural moss to reduce air pollution in the surrounding areas.

(i) Explain the term IoT.



(ii) Outline **one** other method of reducing air pollution in our cities.

2. Copperfish is an award-winning business, based in Co. Wicklow, creating lighting products from salvaged and storm-fallen timber.

(i) Outline **two** benefits of using copper piping as a material when manufacturing the table lamp shown.

1.
2.



(ii) Describe **one** advantage of using salvaged timber for this table lamp.

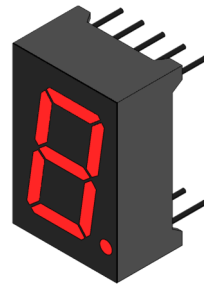
3. The operating voltage of a shower pump motor is 240 V and the current it draws is 11 amps. The power output of the motor is 2400 watts. Calculate the efficiency of the motor (express as a %).

Calculation:



4. An electronic output component is shown.

- (i) Name the component shown.



- (ii) Suggest **two** applications for this component.

5. An elevator with mass of 2000 kg is raised 15 meters in 20 seconds. The elevator has a *factor of safety of 5* in its design specification.

- (i) Calculate the work done and the power required to raise the elevator. (Assume $g = 9.81 \text{ m/s}^2$)

Calculation:

- (ii) Explain what is meant by the term *factor of safety of 5*.

6. The image shows a drill with its chuck mounted at 90° to the motor in the body.



- (i) Name **one** type of gear system which could be used in the drill to transmit motion through 90°.

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- (ii) Outline, with annotated sketches, a means of securing a gear to a cylindrical drive shaft to prevent slippage when the motor is in use.



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7. Ergonomic keyboards, similar to that shown, have become popular in recent times.

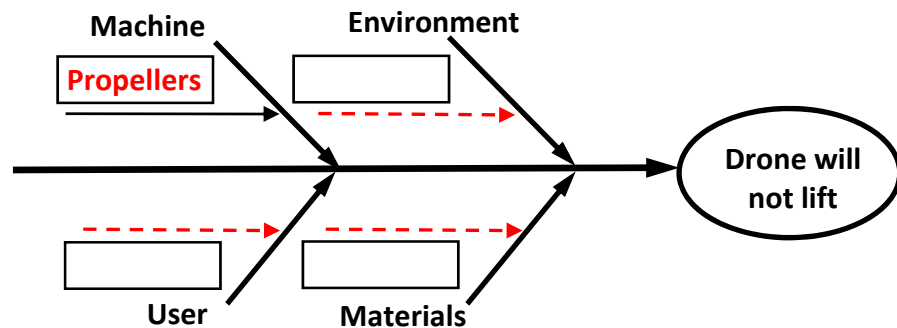


- (i) Explain what is meant by the term *ergonomic*.

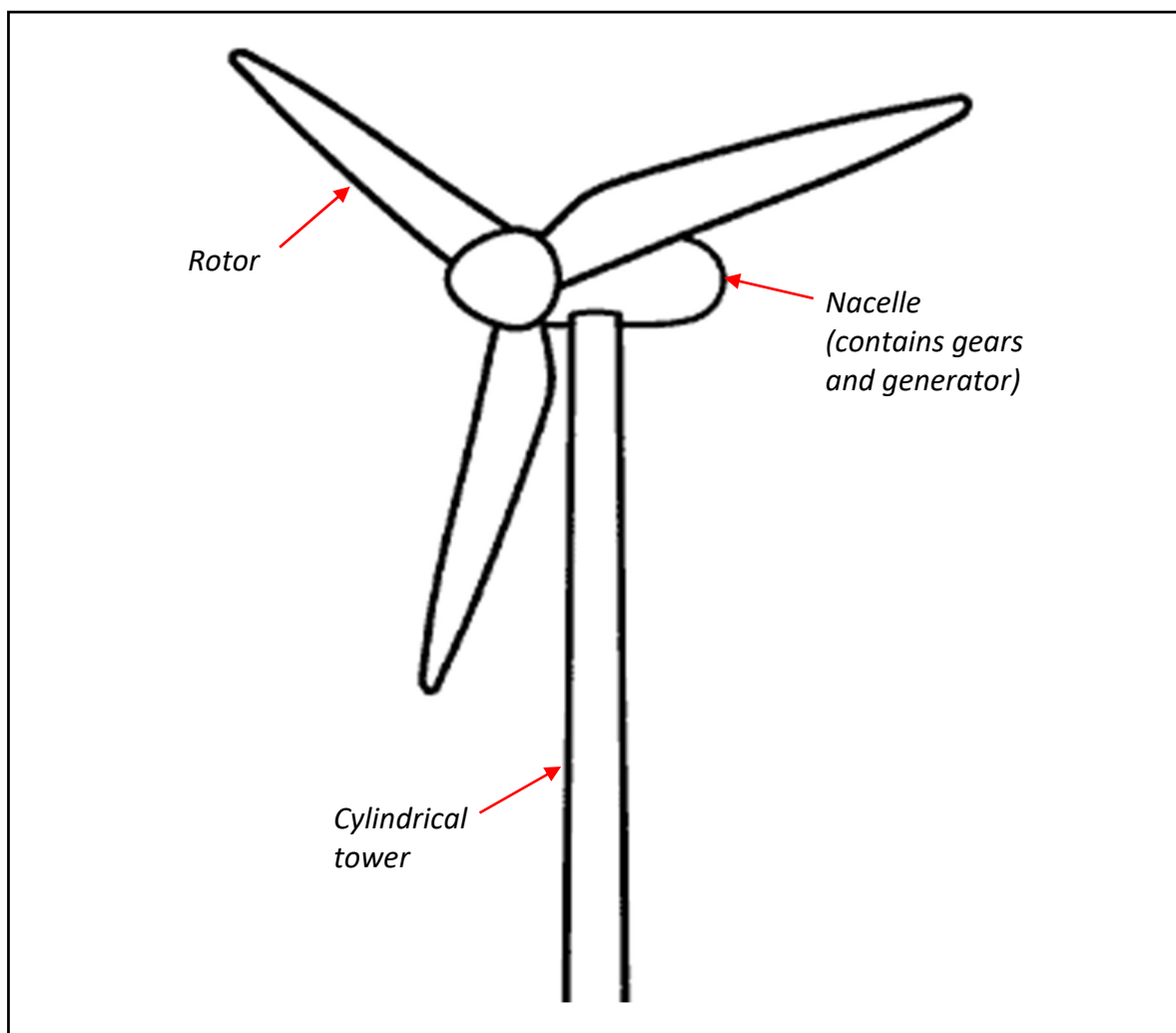
- (ii) Outline **two** reasons for the use of ergonomically designed office products.

1.
2.

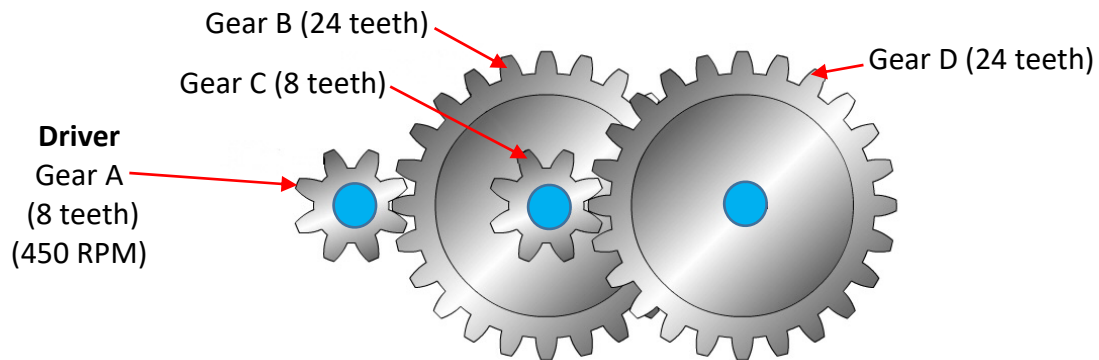
8. Complete the cause and effect diagram below by suggesting **three** factors to analyse the performance of a drone that fails to lift off the ground. One has been completed for you.



9. Use graphical techniques to enhance the profile shape of **each** wind turbine part labelled on the line drawing below.



10. Calculate, using the given data, the output speed of the compound gear train shown.



Calculation:

11. A cycle helmet and attached camera with protective case, is shown in the image. The camera is powered by a rechargeable internal battery.

- (i) State **two** design requirements for the cycle helmet.

1.
2.



- (ii) Give **two** environmental benefits of using rechargeable batteries to power portable products.

1.
2.

12. The gold and sterling silver used by award-winning Irish jewellers, Juvi, is recycled from jewellery, giftware, and electronics.

(i) State **two** material properties of gold that make it suitable for jewellery manufacture.

1.
2.



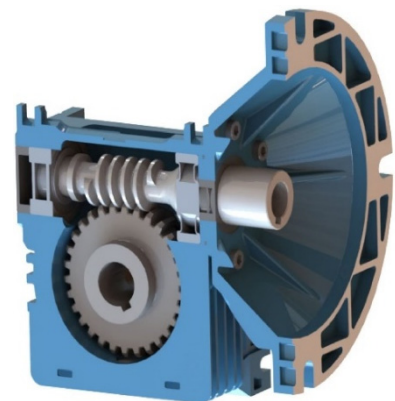
(ii) Distinguish, with an example in each case, between recycling and upcycling.

Recycling:
Upcycling:

13. A cutaway model of a mechanism for a hoist is shown.

(i) Name the mechanism and describe its operation.

Name:
Operation:



(ii) Give **two** reasons for using this mechanism in the hoist.

1.
2.

14. Vacuum forming machines can be used to form intricate hollow thermoplastic objects.

(i) Outline **two** safety hazards to be aware of when using a vacuum forming machine.

1.
2.



(ii) Describe **one** safety feature integrated into a vacuum forming machine.

15. Sketch **two** orthographic views of the 'non-conformist chair' designed by Irish innovator, Eileen Gray in 1926.



Answerbook for Sections B and C

Instructions

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

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

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

Question	
04	
Part	Start each question on a new page
(a)	
(b)(i)	
(b)(ii)	

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

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

Part

[illegible]

Part

[illegible]

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Part

[illegible]

Part

[illegible]

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Part

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Part

[illegible]

Part

[illegible]

Part

[illegible]

Part

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Part

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Part

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Part

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Part

Acknowledgements

Image 1. Page 3. Q.1. <https://www.irishtimes.com/tags/centre-for-research/>

Image 2. Page 3. Q.2. <https://www.madeofirish.com/collections/copper-fish-studio-1>

Image 1. Page 4. Q.3. <https://www.pumpworld.co.uk/Specify/Supergen-Selector>

Image 2. Page 4. Q.4. <https://grabcad.com/library/connector-rj11-rj12-rj45-1>

Image 1. Page 5. Q.6. <https://www.milwaukeeetool.com/Products/Power-Tools/Drilling/Right-Angle-Drills/0721-20>

Image 2. Page 5. Q.6. <https://skycraftsurplus.com/products/hobby-motor-1-5-12-volt-dc-3-000-rpm.html>

Image 3. Page 5. Q.7. <https://www.logitech.com/en-us/about/designawards.html>

Image 1. Page 6. Q.9. <https://easydrawingguides.com/how-to-draw-a-wind-turbine/>

Image 1. Page 7. Q.10. <https://www.notesandsketches.co.uk/Gears.html>

Image 2. Page 7. Q.11. <https://driftinnovation.com/products/drift-vented-helmet-mount-1>

Image 1. Page 8. Q.12. <https://www.juvidesigns.com/>

Image 2. Page 8. Q.13. <https://www.iqsdirectory.com/articles/gearbox/gear-reducers.html>

Image 1. Page 9. Q.14. <https://www.hindleys.com/shop-online/vacuum-forming-sheet-hips.html>

Image 2. Page 9. Q.15. <https://www.museum.ie/en-IE/Museums/Decorative-Arts-History/Exhibitions/Eileen-Gray>

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Leaving Certificate – Higher Level

Technology Section A and Answerbook

Monday 26 June

Afternoon 2:00 - 4:30