



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2024 Technology

Section A and Answerbook

Higher Level

Monday 24 June Afternoon 2:00 - 4:30

160 marks

Examination Number

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Date of Birth

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For example, 3rd February
2005 is entered as 03 02 05

Centre Stamp

Instructions

Write your Examination Number and your Date 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 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.

Section A.

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

Write your answers in the spaces provided.

1. Apple Vision Pro is an augmented reality and virtual reality headset which has recently been launched.

Distinguish between augmented reality (AR) and virtual reality (VR).



2. Garden decking panels are increasingly being manufactured from composite materials.

Outline **two** advantages of using composite materials when manufacturing garden decking.

1.
2.



3. A 4K UHD interactive touch screen with integrated proximity sensor is shown.

(i) Explain the term **UHD**.

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(ii) State the function of the proximity sensor integrated into this screen.

4. The guitar amplifier shown may typically contain a Darlington pair.

(i) Name the main electronic component used in a Darlington pair.

(ii) Outline how a Darlington pair works.



5. (i) Use the resistor colour code table to calculate the value of the resistor shown.

Resistor bands:
Brown
Black
Red
Gold



Value:

Tolerance code		
	Brown	1%
	Red	2%
	Gold	5%
	Silver	10%

Colour code		
	Black	0
	Brown	1
	Red	2
	Orange	3
	Yellow	4
	Green	5
	Blue	6
	Violet	7
	Grey	8
	White	9

(ii) Accounting for tolerance, state the maximum and minimum possible values for this resistor.

Maximum value:

Minimum value:

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6. Network diagrams use nodes similar to that shown.

(i) Explain the abbreviations.

EST:

LFT:

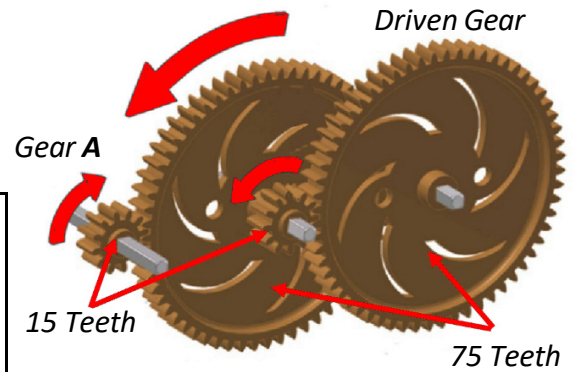
EST	EFT
Task:	
LST	LFT

(ii) Explain how the critical path of a network diagram is established.

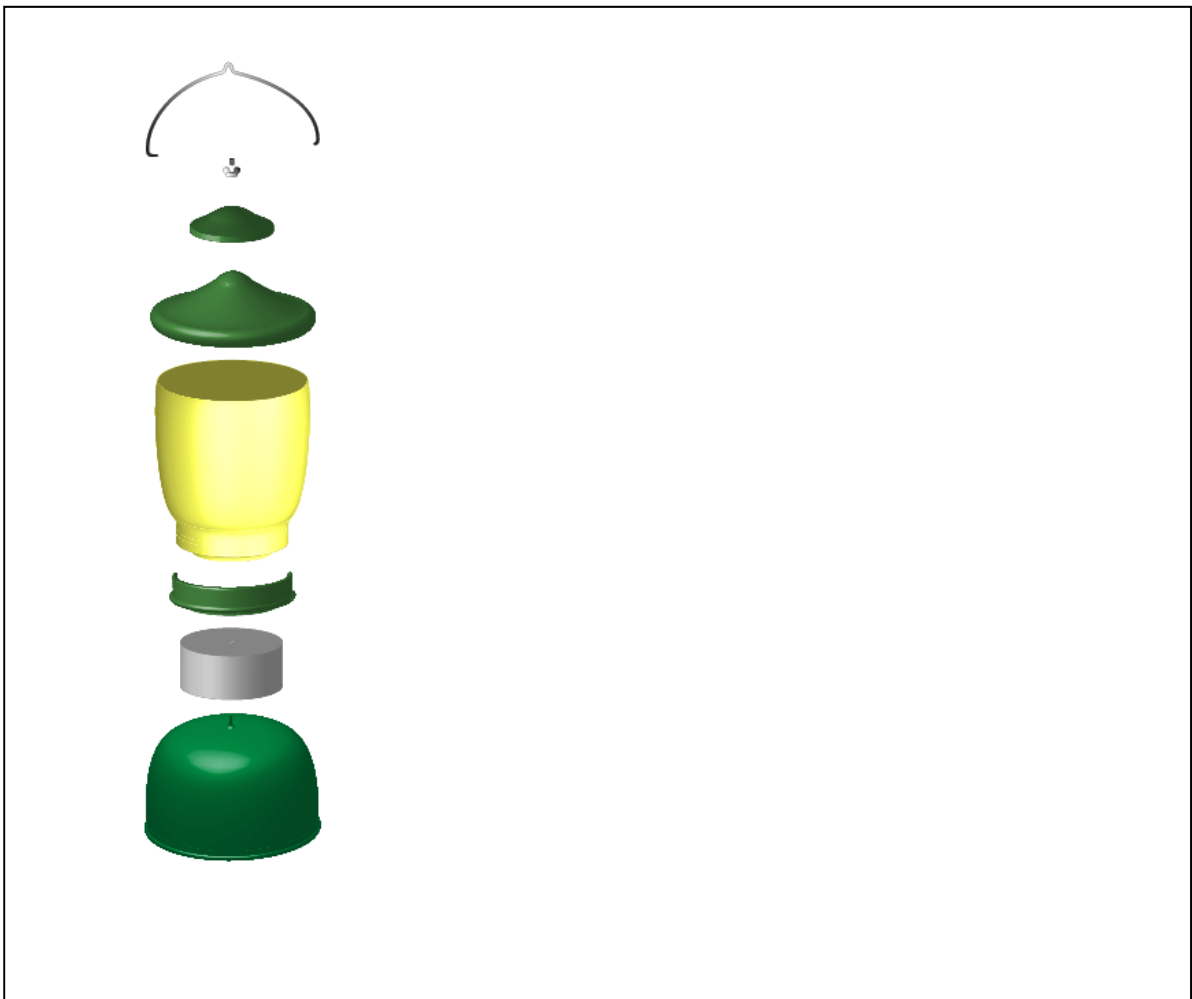
7. (i) Name the type of gear train shown in the image.

- (ii) Calculate the angular velocity of the driving gear **A**, if the output speed at the driven gear is 17 RPM.

Calculation:



8. An exploded view of a garden lantern is shown. Sketch a pictorial view of the assembled lantern.



9. The voltage drop at 20 mA is a common specification for light emitting diodes (LEDs). The voltage drop for a batch of coloured LEDs is shown below.

Light Emitting Diode				
	Red LED	Orange LED	Yellow LED	Green LED
Voltage drop at 20 mA	1.8 V	2.0 V	2.3 V	3.0 V

- (i) Using the given data, calculate the value of the protective resistor required for one green LED in a 12 V lighting project.

Calculation:

- (ii) Describe the effect of replacing the green LED with **two** red LEDs placed in series for the same lighting project.

10. The GPS luggage tag shown uses *satellite navigation systems* and *cellular data connectivity* to track luggage. The tag can also be scanned using a *QR code* on the back of the device.



Explain **each** of the terms.

Satellite Navigation Systems:
Cellular data connectivity:
QR Code:

11. (i) Calculate the mechanical advantage of a forklift if it lifts a mass of 1800 kg with an effort force of 200 N. Assume $g = 9.81 \text{ m/s}^2$

Calculation:



- (ii) Explain the advantage of a low *centre of gravity* on the operation of the forklift.

12. Using the headings in the table below, describe the carbon footprint associated with producing small batches of car parts, such as the bracket shown, using 3D printing rather than traditional manufacturing processes.

*alternator bracket
for a vintage car*



Energy Consumption:
Waste generation:
Materials used:

13. eBörd is a smart table with wireless charging capabilities built into its glass surface. It generates energy through the capture of indoor and outdoor light.



- (i) State **one** energy conversion that takes place in the eBörd table.

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- (ii) Outline **two** reasons for using tubular metals in the design of the table shown.

1:
2:

14. Epoxy adhesives and PVA glue are commonly used when assembling materials.

- (i) Suggest an appropriate application for epoxy resin **and** for PVA glue.

Epoxy resin:
PVA glue:



- (ii) State **two** safety hazards to be aware of when using adhesives.

1.
2.

15. Make well-proportioned freehand sketches of **two** principal orthographic views of the fireside stool shown in the image below, which was designed by Irish furniture maker Tricia Harris.



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.

Part	Question
(a)	04
(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]

Part

[illegible]

A diagram showing a rectangle divided into two equal squares by a vertical line. The rectangle is labeled with 'a' on the top and bottom edges and 'b' on the left and right edges.

Part

[illegible]

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Part

[illegible]

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Part

[illegible]

Part

[illegible]

Part

[illegible]

--	--

Part

[illegible]

--	--

Part

[illegible]

Part

[illegible]

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Part

[illegible]

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Part

[illegible]

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Part

[illegible]

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Part

Part

Acknowledgements

Images

Image 1 page 3: <https://apple.com/>

Image 2 page 3: <https://outdoorliving.ie/>

Image 3 page 3: <https://www.flatpanelshd.com/>

Image 1 page 4: [https:// https://reverb.com/](https://https://reverb.com/)

Image 2 page 4: <https://www.silicontechnolabs.in/>

Image 1 page 5: <https://www.vexforum.com/t/compound-gear-ratios/29604>

Image 2 page 5: <https://thelawlers.com/Blognosticator/?p=1170>

Image 1 page 6: <https://www.ledsupply.com/blog/wp-content/uploads/>

Image 2 page 6: <https://www.nutfind.com/>

Image 1 page 7: <https://toyotaforklift.com/>

Image 2 page 7: <https://www.researchgate.net/publication/358043592/figure/fig4/>

Image 1 page 8: <https://www.ebord.co/>

Image 2 page 8: <https://www.rockler.com/stick-fast-ca-glue-dry-box-kit>

Image 1 page 9: <https://origineire.com/designers/tricia-harris/>

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Leaving Certificate – Higher Level

Technology Section A and Answerbook

Monday 24 June

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