



Leaving Certificate Examination, 2010

Technology

Higher Level

Friday, 25 June
Afternoon, 2:00 - 4:30

There are **three** Sections in this paper. Attempt **all three** Sections.

Section A: Core - Short-answer questions.

Section B: Core - Long-answer questions.

Section C: Options - Long-answer questions.

Section A - Core (72 marks)

Instructions:

- (a) Answer **any twelve** questions in the spaces provided.
All questions in Section A carry 6 marks.
- (b) Draw all sketches in pencil.
- (c) Hand up this booklet at the end of the examination.
- (d) Write your examination number in the box provided
and on all other pages used.

Examination Number:

Centre Number

Section	Mark
Section A	
Section B	
Section C	
Total	
Grade	

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

1. The Health and Safety Authority (HSA) provides a range of standardised safety signs. For the sign shown:

(i) Identify the hazard.

(ii) Where is this sign likely to be used?



2. A variety of materials is used in the manufacture of modern sports footwear.

The materials listed below were used in the manufacture in the football boots shown.

Outline **one** property of each material.



Material	Use	Property
Kevlar	Body of boot	
Foamed polyurethane	Inner lining	
Moulded polyurethane	Sole of boot	

3. Leading mobile phone manufacturers have announced that a standardised universal charger, based on the mini-USB format, will be implemented from 2012. These energy-efficient chargers will result in an estimated 50 per cent reduction in standby energy consumption.

Outline **two** other environmental advantages of the introduction of a standardised universal mobile phone charger.

(i) _____

(ii) _____



4. The graphic shows a hand-operated winch.



(i) Name a mechanism suitable for use in hand-operated winches to prevent them unwinding under load.

(ii) The large gear of a winch has 120 teeth and the small gear has 12 teeth. A force of 10N applied to the handle produces 95N at the hook. Calculate the efficiency of the winch.

Calculation:

5. The manager of a tourist heritage site has decided to use ICT to promote the latest attraction. From the list below, select an appropriate file format for each output.

mp3 bmp doc tiff gif avi xls odf

Output	File format
Leaflet to outline a history of the site	
Short video to demonstrate the variety of attractions in the local area	
Colour logo of local tourist area for web use	
Sound file for historical commentary	

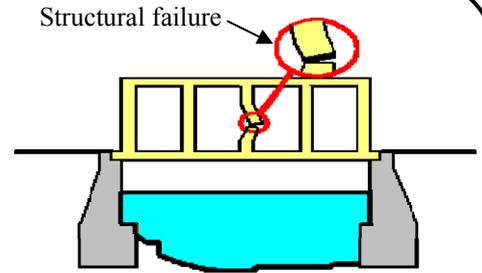
6. A manufacturer of children’s playground equipment specified a ‘factor of safety of 5’ for the supporting frames of their products.

(i) Explain the term ‘factor of safety of 5’.



(ii) Outline **two** reasons for specifying a factor of safety when designing playground equipment.

7. A bridge structure, made from solid steel bars of square cross section, has been designed as a prototype. A graphic of the prototype is shown. The point of failure after the structure has undergone destructive testing is highlighted.



(i) Explain the terms:

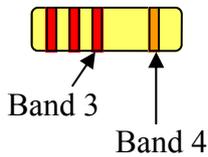
Prototype

Destructive test

(ii) Suggest a modification to the design which would prevent the failure.

8. The resistor colour code table is shown.

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



(i) Identify the value of a resistor with a colour sequence of: Red, Red, Red, Gold. **Value =** _____

(ii) Describe the significance of:

Band 3 _____

Band 4 _____

9. Make well-proportioned freehand sketches of three principal orthographic views of the wind-up torch shown.



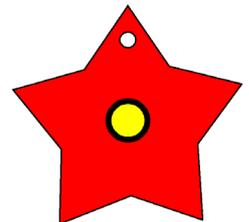
- 10.** A domestic garage alarm uses a logic gate system to sound a siren if either of the following occurs:
- the garage door is opened
 - the window is opened.

Draw a simple logic gate system and truth table to operate the alarm.

Logic gate system

Truth table

- 11.** An incomplete table of tasks for a school mini-company group that intends to produce flashing stars for the Christmas market is shown below.



- (i) Complete the table of tasks and draw a critical path diagram for the project.

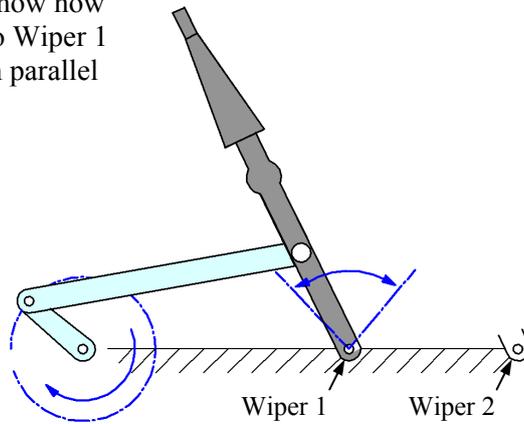
Task		Time (weeks)	Depends on
A	Design star	1	-
B	Source materials	1	A
C	Team 1—make star	4	B
D	Team 2—build circuit	2	B
E	Team 3—marketing	3	
F	Assembly	1	
G	Sell products	1	

Critical path diagram

- (ii) How many weeks will the project take to complete? _____

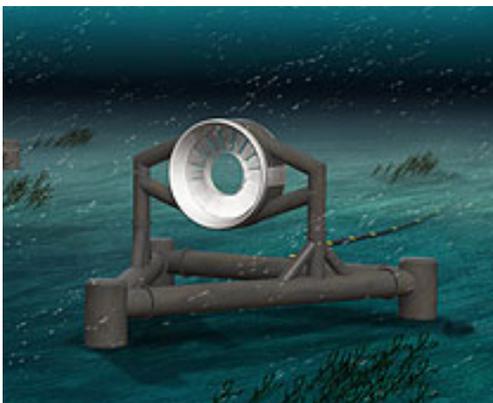
12. A treadle linkage converts rotary motion to *reciprocating motion*.
The graphic shows a treadle linkage which operates a pair of windscreen wipers.

(i) Complete the graphic to show how Wiper 2 could be linked to Wiper 1 so that both wipers remain parallel when in motion.



(ii) Explain the term *reciprocating motion*.

13. The Louth-based company OpenHydro received the 2009 innovation award from Engineers Ireland. OpenHydro develops turbines for underwater tidal use and has a company motto of: '*silent, invisible, predictable, renewable energy*'.



With reference to renewable sources of energy, explain why **each** element of the company motto is important.

Silent _____

Invisible _____

Predictable _____

Renewable _____

14. Skateboards can be manufactured from a range of materials.

Outline **two** important considerations when selecting a suitable material for:



The deck A:

(i) _____

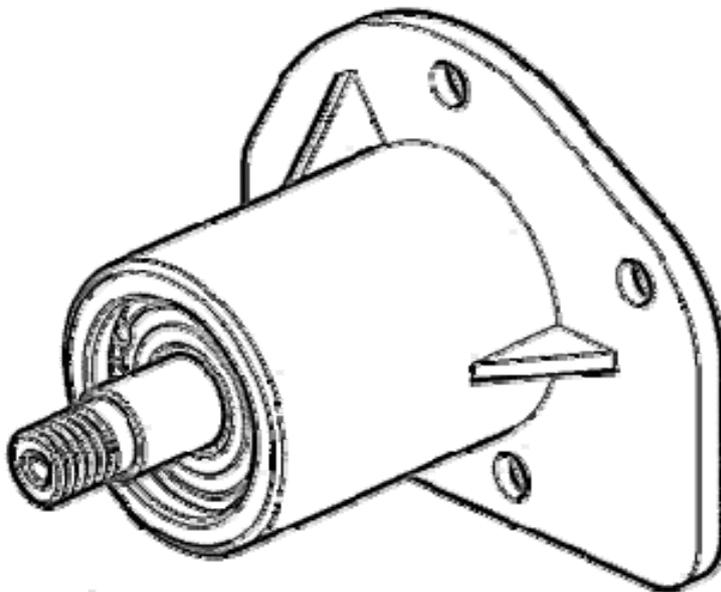
(ii) _____

The wheels B:

(i) _____

(ii) _____

15. Use **two** graphic techniques to enhance the graphic representation of the motor shown.



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