



Leaving Certificate Examination, 2011

Technology

Higher Level

Friday, 24 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. In the promotion of alternative sources of energy for cars, a concept for a commercial solar-charging station is illustrated. Outline **three** benefits of such a plan.

- (i) _____

- (ii) _____

- (iii) _____



2. Describe **two** specific safety precautions that should be observed when:

Cutting a workpiece made in medium density fibreboard (MDF):

- (i) _____
- (ii) _____



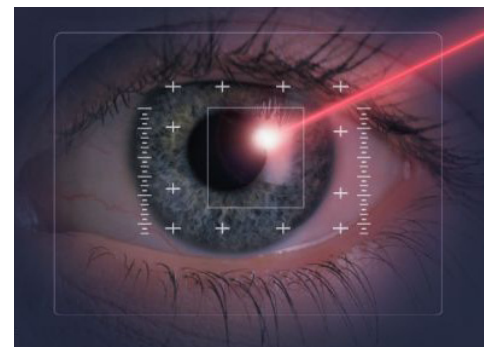
Soldering components onto a printed circuit board (PCB):

- (i) _____
- (ii) _____

3. Technology has a significant influence on medical treatments, drugs and diagnostic techniques. The reshaping of the cornea in eye surgery is an example.

(i) Identify the technology used.

(ii) Outline **two** advantages of using this technology rather than traditional surgery.



4. The Salif Lemon squeezer by innovative designer, Philip Starck, is a source of debate.



(i) Name a suitable material for the lemon squeezer.

(ii) Explain why this material is suitable, making reference to function and manufacture.

5. Explain the computer terms:

(i) Wi-Fi

(ii) Cache

(iii) Cookies

6. The room temperature indicator shown uses a 'smart material' as a sensor.

(i) What are 'smart materials'?

(ii) Describe the operation of the temperature indicator shown.



7. Describe the operation of the bell-crank mechanism used in the bicycle braking system shown.



Outline the importance of friction in the operation of this braking system.

8. A 3D graphic of a CD holder is shown.

Compile a Work Breakdown Structure (WBS) diagram for the manufacturing of the holder.



Suggest a suitable automated manufacturing method for the production of the acrylic ends for the holder.

Method: _____

9. The graphics below show a resistor colour code table and three resistors **R1**, **R2** and **R3**.

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

(i) Calculate the values of resistors **R1**, **R2** and **R3**.



R1 - Red, Red, Red, Gold.

Value = _____



R2 - Blue, Orange, Black, Gold.

Value = _____



R3 - Green, White, Black, Gold.

Value = _____

(ii) A light-emitting diode has a current rating of 0.15mA in a 9V circuit. Calculate the size of the protective resistor needed.

(iii) Select the most suitable resistor from **R1**, **R2** and **R3** to protect the above LED.

10. (i) Outline the meaning of the term *ergonomics*.

(ii) State **three** ergonomic factors which should be considered when designing a computer desk.



11. Thermal and electrical properties of materials are very important in the electronics industry. Explain the properties *thermal conductivity* and *thermal insulation* with specific reference to the materials used to make the soldering iron shown.



Thermal conductivity

Thermal insulation

12. There are three classes of lever.

(i) Identify which class of lever is used in each of the following items:

A



Class _____

B



Class _____

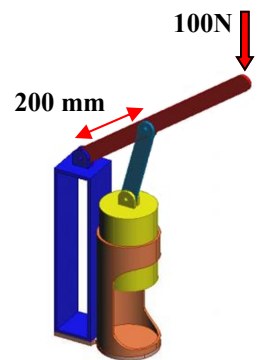
C



Class _____

(ii) For the can crusher shown, calculate the force applied to the can if the force applied at the end of the lever is 100N. (The length of the lever is 500 mm, distance to pivot is 200 mm)



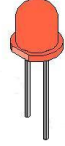

Calculation:



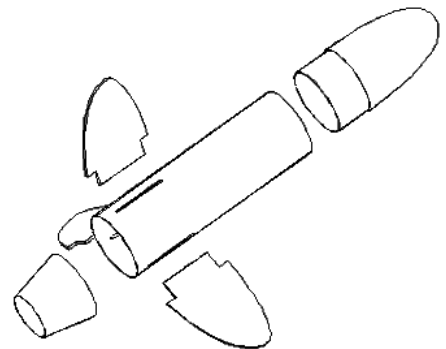
13. Make well-proportioned freehand sketches of three principal orthographic views of the portable radio shown.



14. Polarised electronic components must be connected correctly in a circuit. Complete the table by naming each component and by describing a feature which identifies the correct way to connect it.

Component	Name	Identifying feature of component
	Diode	The band on the casing indicates the cathode
		
		
		

15. An exploded view of a toy rocket is shown. Sketch a pictorial view of the **assembled** rocket and use rendering techniques to enhance the sketch.



Blank Page