



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

***Leaving Certificate Applied, 2014***

**Vocational Specialism - Technology**  
**(240 Marks)**

*Wednesday 11 June, Afternoon 2:00 to 4:00*

*General Directions:*

1. Write your examination number in this box:

2. There are two sections in this paper.

Section 1– Answer **all three** questions. - 90 marks

**Q1. - Short answer questions**

**Q2. - Graphical Communication**

**Q3. - Health and Safety**

Section 2– Five questions, answer **any three** - 150 marks

**Q1. - Introducing Technology**

**Q2. - Design and Manufacture**

**Q3. - Water Technology**

**Q4. - Electrical Understanding and Basic Electronics**

**Q5. - Tools and Equipment**

3. Write your answers in the spaces provided and include sketches (in pencil) where appropriate.

**Centre Stamp**

1.	Total of end of page totals	
2.	Aggregate total of all disallowed question(s)	
3.	Total mark awarded (1 minus 2)	
4.	Bonus mark for answering through Irish (if applicable)	
5.	Total mark awarded if Irish Bonus (3 plus 4)	
	<u>Note:</u> The mark in row 3 (or row 5 if Irish bonus is awarded) must equal the mark in the Total Mark box on the script.	

Section	No.	Mark
Section 1	<b>1</b>	
	<b>2</b>	
	<b>3</b>	
Section 2	<b>1</b>	
	<b>2</b>	
	<b>3</b>	
	<b>4</b>	
	<b>5</b>	
Total		

# Question 1

## Compulsory

(40 marks)

1. Answer **any Ten** of the following fifteen short questions.

- (a) Brass has been used for decorative metalwork for thousands of years. Suggest **two** reasons for this.

Reason 1 \_\_\_\_\_

\_\_\_\_\_

Reason 2 \_\_\_\_\_

\_\_\_\_\_



Brass plaque

- (b) A tap for a kitchen sink is shown. Name a suitable material for the tap and give a reason for your choice.

Material \_\_\_\_\_

Reason \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Kitchen sink tap

- (c) Solar electric power is becoming very popular for road traffic signs. List **two** advantages of solar power when used for this purpose.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_



Solar powered traffic sign

(d) The pallet truck shown has a rising platform. Name the mechanism for raising and lowering the upper deck and give a reason why this particular mechanism is used.

Name \_\_\_\_\_

Reason for use \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_



Pallet truck

(e) List **four** stages in the process of vacuum forming.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_



Vacuum former

(f) Complete the table by naming the unit used to measure **each** of the following quantities.

Quantity	Mass	Distance	Electric Current	Power
Unit				

(g) Name a machine suitable for bending acrylic as shown and briefly describe the process.

Machine \_\_\_\_\_

Process \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Bent acrylic

(h) Speech recognition technology is now widely available. Outline **one** practical application of this technology.

Answer \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Speech recognition technology

(i) Suggest a suitable use for a flexible hose in a plumbing system.

Use \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Flexible hose

(j) Name the plumbing apparatus shown and explain its function.

Name \_\_\_\_\_  
Function \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



(k) Both LED and LCD technologies are used for TV screens. Explain **both** terms.

LED \_\_\_\_\_  
LCD \_\_\_\_\_



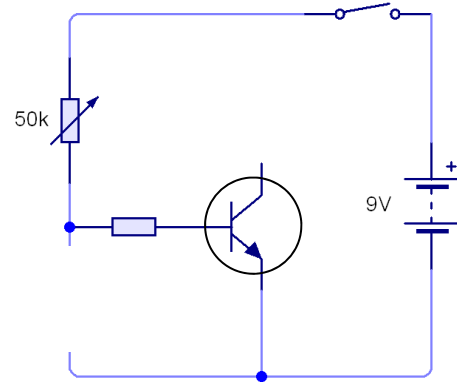
- (l) Calculate the cost of running a 0.1 kW electric food slicer for 1 hour if a unit of electricity costs 20 cent.

Calculation



Kitchen food slicer

- (m) Part of a dark sensing circuit is shown. The transistor switches on a bulb when it gets dark. An LDR is used to sense the dark. The symbols for an LDR and bulb are shown below. On the circuit diagram opposite, redraw these symbols in their correct positions.

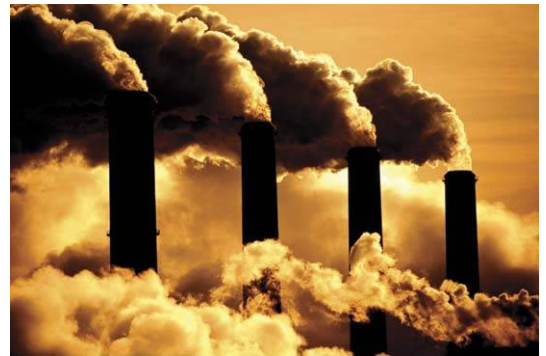


Dark sensing circuit

- (n) One of the major contributors to global warming is the burning of fossil fuels to generate power. Name **two** such fossil fuels.

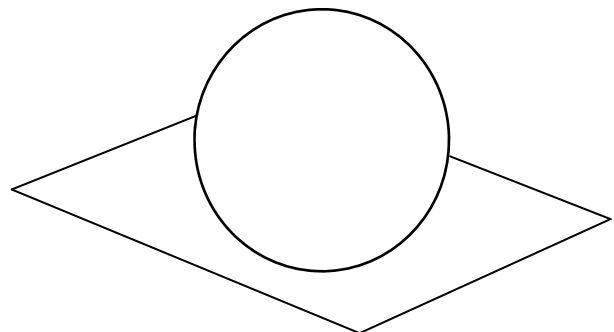
1 \_\_\_\_\_

2 \_\_\_\_\_



Chimney stacks

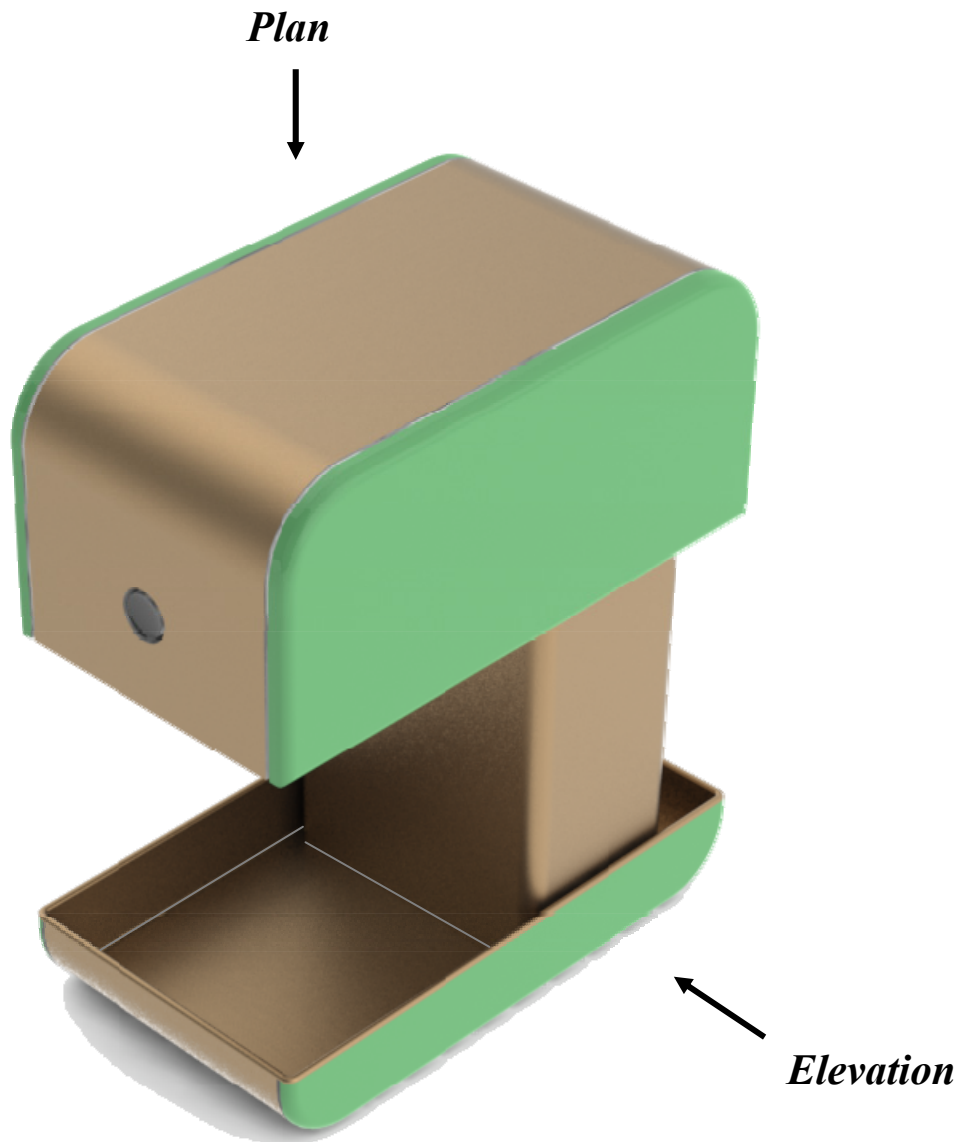
- (o) Apply shading to the given diagram to enhance the appearance of the sphere.



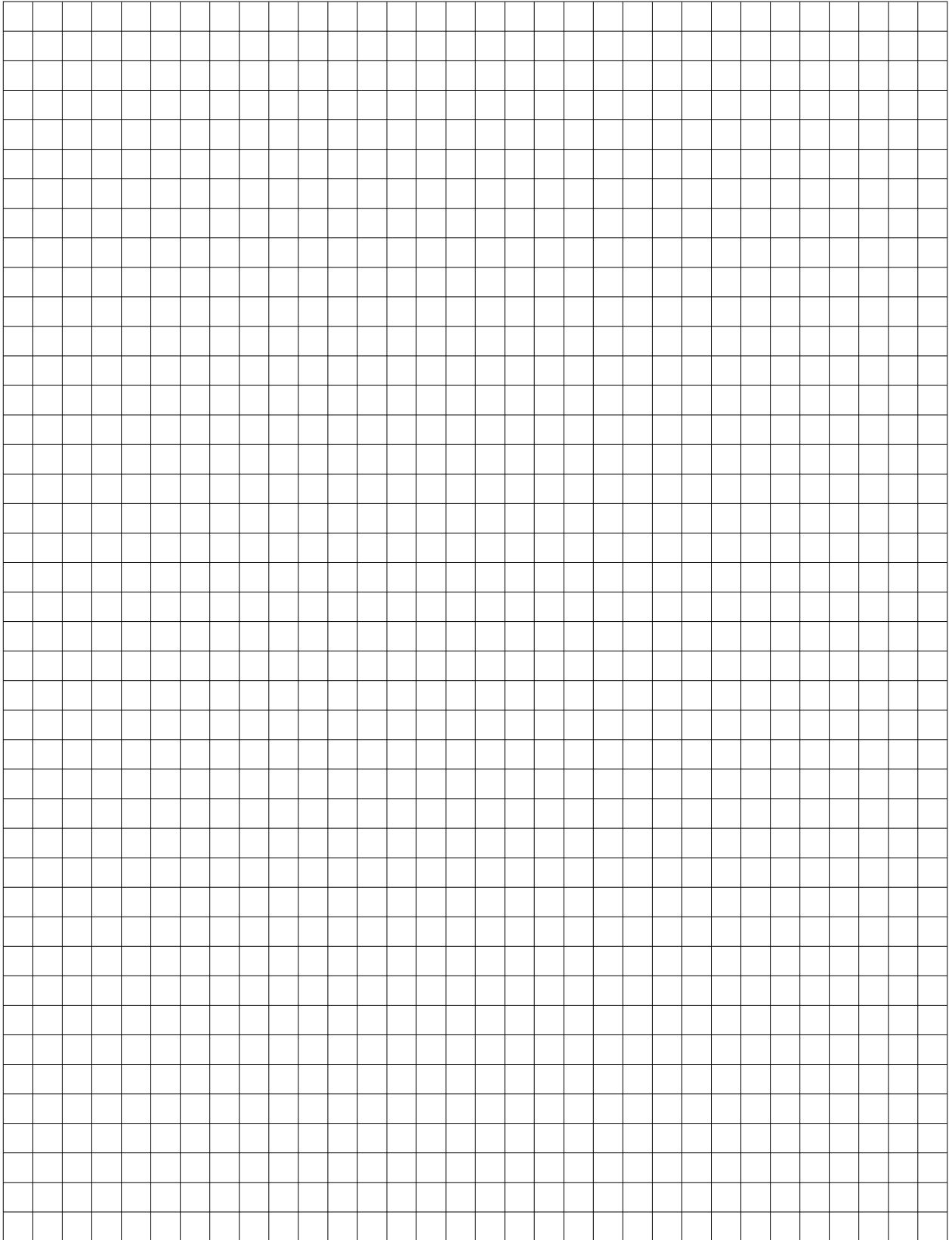
**Compulsory**

**2. Graphical Communication**

- (a) A 3D graphic of a coffee maker is shown below. In the space opposite draw a well proportioned Elevation and Plan of the coffee maker.
- (b) Estimate and include 4 dimensions on your completed drawing.



**Coffee Maker**



Estimate and include 4 dimensions on your completed drawing.

# Compulsory

## 3. Health and Safety

(a) (i) Suggest **two** safety issues that are evident in the picture of the table-saw shown below.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_



Table-saw

(ii) List **two** safety precautions that should be observed when using a soldering iron.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_



Soldering iron and stand

(iii) Wood lacquers tend to be *volatile*. List **two** safety precautions that should be observed when using wood lacquers.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_



Wood Lacquer



(b) Outline **three** safety features of a properly managed workshop.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(c) Describe a specific health and safety precaution that must be taken when carrying out each of the processes shown.

Using a solder fitting in plumbing \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Plumbing a solder fitting

Cutting a steel section \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Cutting a steel section

## Section 2 (150 marks)

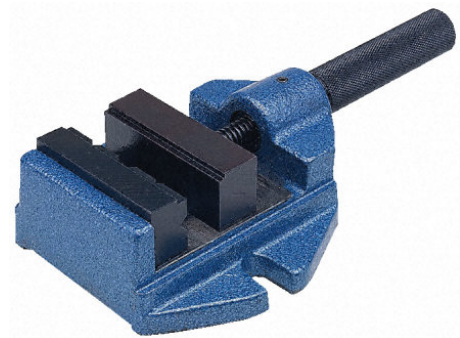
Answer **ANY THREE** questions from this section.

### 1. Introducing Technology

(50 marks)

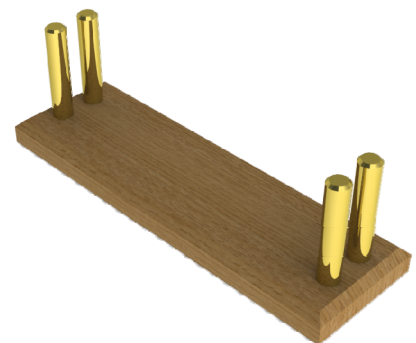
- (a) An image of a drill vice is shown. In the space below draw a 3D sketch of the vice and apply appropriate shading.

3D Sketch



Drill Vice

- (b) A letter holder made from oak and brass is shown. In the space below, show with the aid of sketches, a method of fixing the brass rods securely to the oak base.



Letter Holder

(c) Describe **three** steps in the process of making the mould shown. The mould is to be used for vacuum forming.



Vacuum forming mould

Answer \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Vacuum former

(d) (i) Climate change has become a major problem for the world. Outline **two** negative impacts of climate change.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

(ii) Explain the meaning of the following:

Renewable energy \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Biofuels \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## 2. Design and Manufacture

(50 marks)

(a) A design for a clock is shown. The base pieces and face are made from sheet metal and the stem is made from wood. The clock has a spray-painted finish.

(i) Describe in detail a method of joining the base to the wooden stem.

Answer \_\_\_\_\_

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(ii) Describe the process of bending the base pieces and name the machine used to do this.

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(iii) The image shown represents the face of the clock with a circle drawn on it. The circle passes through the centres of the 12 holes which complete the clock face. Draw the lines necessary to locate the centres of the holes and describe an effective method of drilling the holes cleanly in the sheet metal.

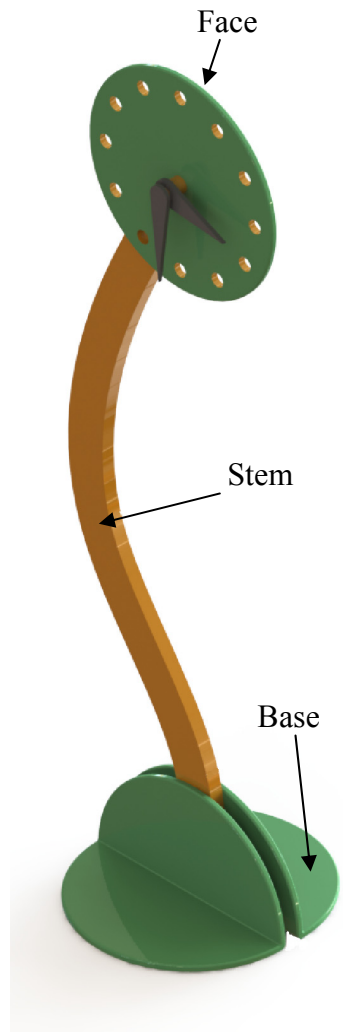
Answer \_\_\_\_\_

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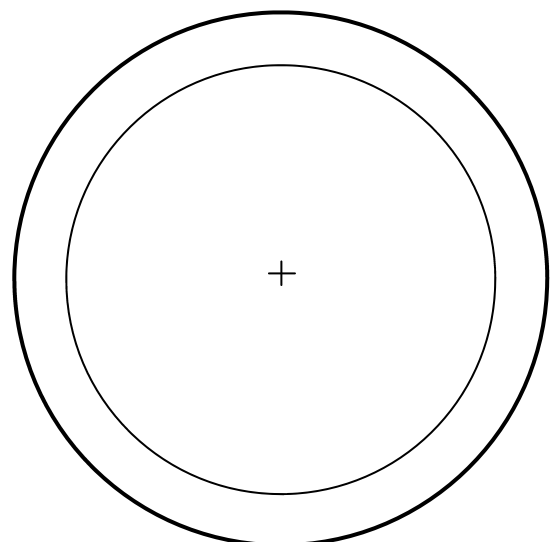
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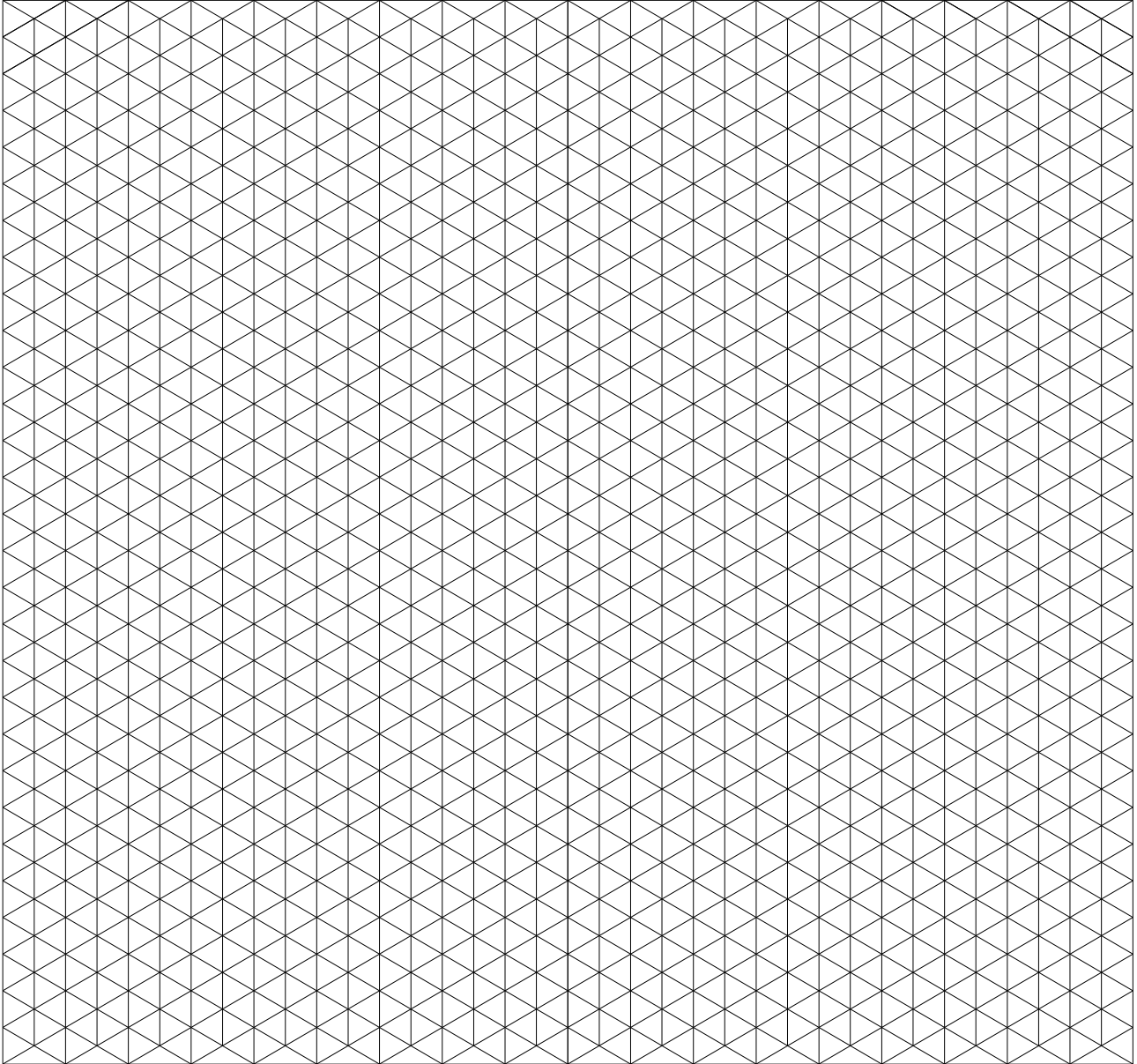
**Clock**



- (b) (i) In the *Design and Manufacture* module you designed and manufactured a product. Name the product you made and draw an isometric sketch of it on the grid below.

Product Name \_\_\_\_\_

\_\_\_\_\_



- (ii) Outline the environmental impact of any **two** of the materials you used in this product.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

### 3. Water Technology

(50 marks)

(a) (i) Describe **two** sources of water pollution.

1 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



(ii) Describe briefly **two** treatment methods used to make water fit for human consumption.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

(b) Irish Water is installing water meters to the public water supply of every house in the country. Suggest **two** reasons for this initiative.

Reason 1 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Reason 2 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Water Meter

(c) A circulating pump and a pipe thermostat for a central heating system are shown.

(i) What is the function of the circulating pump?

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(ii) What is the function of the pipe thermostat?

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Circulating Pump



Pipe Thermostat

(d) Name and explain the function of **each** of the plumbing tools shown.

Name \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_



Name \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_



Name \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_



Name \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_



## 4. Electrical Understanding and Electronics

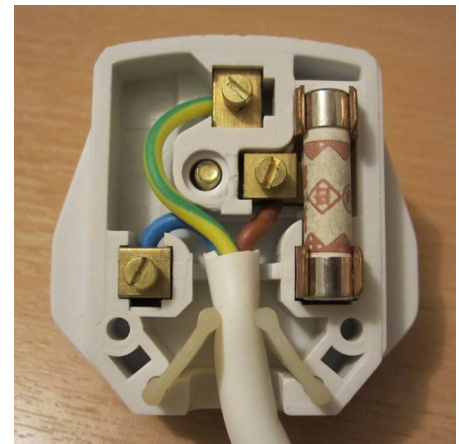
(50 marks)

- (a) A picture of a 3 pin plug with the cover removed is shown. State the colour of each of the wires.

Live \_\_\_\_\_

Earth \_\_\_\_\_

Neutral \_\_\_\_\_



3 Pin Plug

- (b) A picture of an automatic nightlight for a child's room is shown. An LDR (photocell) is used as part of the circuit.

- (i) Explain the term LDR.

LDR \_\_\_\_\_

- (ii) What is the function of the LDR in this circuit?

Function \_\_\_\_\_



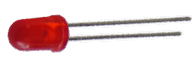
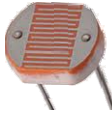
\_\_\_\_\_

- (iii) Make a sketch of a typical LDR in the space below.



Nightlight

- (iv) An LDR is an *electronic* component. In the table below indicate which components are *electronic* and which are *electrical*.



- (c) (i) Explain the term CFL and suggest a reason why CFLs are replacing standard filament light bulbs.

CFL \_\_\_\_\_

Reason \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- (ii) If a unit of electricity costs 20 cent, calculate the cost of running a 2 kW electric fan heater on full power for 12 hours.

Calculation



- (d) An image of an electric car is shown opposite. The battery pack consists of thousands of lithium-ion batteries.

- (i) Suggest a reason why lithium-ion batteries are used.

Reason \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Battery pack

Electric Car

Electric motor

- (ii) The battery pack is fixed under the floor of the car. Suggest **two** reasons for this.

Reason 1 \_\_\_\_\_

\_\_\_\_\_

Reason 2 \_\_\_\_\_

- (iii) Many electric cars use an AC induction motor. Explain the terms AC and DC.

AC \_\_\_\_\_ DC \_\_\_\_\_

## 5. Tools & Equipment

(50 marks)

(a) A range of equipment found in workshops is shown.

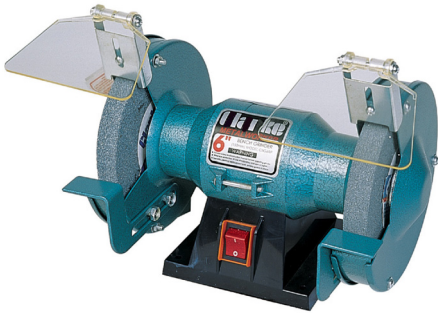
1.



2.



3.



4.



Name each piece of equipment and give its use.

No.	Name	Use
1		
2		
3		
4		

(b) Outline briefly **four** stages in the making of this bedside locker.

1 \_\_\_\_\_  
\_\_\_\_\_  
2 \_\_\_\_\_  
\_\_\_\_\_  
3 \_\_\_\_\_  
\_\_\_\_\_  
4 \_\_\_\_\_  
\_\_\_\_\_



Bedside Locker

(c) Draw sketches of **any 4** of the following tools in the spaces below.

Try square	Sliding bevel	Plane	Tenon saw	Hacksaw

(d) Thermoplastics can be shaped into three dimensional forms by first heating them in an oven.

(i) Name a suitable plastic for thermoforming.

Answer \_\_\_\_\_

(ii) What precautions should be taken when heating plastics in an oven?

Answer \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



Oven for thermoforming

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