



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

**Leaving Certificate Applied 2014**

**Marking Scheme**

**Technology**

**Common Level**

## **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

## **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



**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.

<b>Centre Stamp</b>
---------------------

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 hundreds of years. Suggest **two** reasons for this.

Reason 1 **Attractive metal-2 marks**

---

Reason 2 **Easy to work with, etc-2 marks**

---



Brass plaque

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

Material **Stainless steel/ brass with chrome finish- 2 marks**

Reason **Hard wearing, easy to clean etc.-2 marks,**

---

---

---



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 **No need for electrical supply-2 marks**

---

2 **Good visibility, etc-2 marks**

---



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 **Scissors mechanism- 2 marks**

Reason for using **Strong, easy to adjust,etc.,- 2 marks**

---



---



Pallet truck

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

- 1 **Prepare mould-1mark**
- 2 **Cut plastic to size -1mark**
- 3 **Place mould and plastic in former-1mark**
- 4 **Switch on vacuum former and mould-1mark**



Vacuum former

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

Quantity	Mass	Distance	Electric Current	Power
Units	<b>Kilogram -1mark</b>	<b>Kilometre -1mark</b>	<b>Amperes(Amps) -1mark</b>	<b>Watt -1mark</b>

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

Machine **Strip heater-1 mark**

Process **Mark bend position  
Secure on heater  
Switch on heater and heat plastic  
Use machine mechanism to bend plastic,  
etc**

**Any 3 x mark**



Bent acrylic

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

Answer **Can be used by people with a disability.**  
**Can be used as a security device etc.**

**Any 1 - 4 marks**



Speech recognition technology

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

Use **Connecting a sink tap to water supply, etc.,4 marks**

---

---

---



Flexible hose

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

Name **Pressure vessel - 2 marks**

Function **Used to increase the water pressure from a sunken water well - 2 marks**

---

---



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

LED - **Light-emitting diode – 2 marks**

LCD - **Liquid-crystal-display – 2 marks**



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

Solution

$$\text{Cost} = 0.1\text{kW} \times 1\text{hrs} \times \text{€}0.20 = \text{€}0.02$$

**Correct formula = (2 marks)**

**Correct solution = (2 marks)**



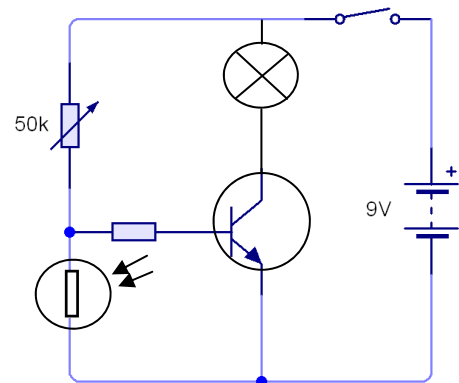
Kitchen food slicer

- (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.

Redraw these symbols on the circuit diagram



**2 marks each**



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 **Coal – 2 marks**

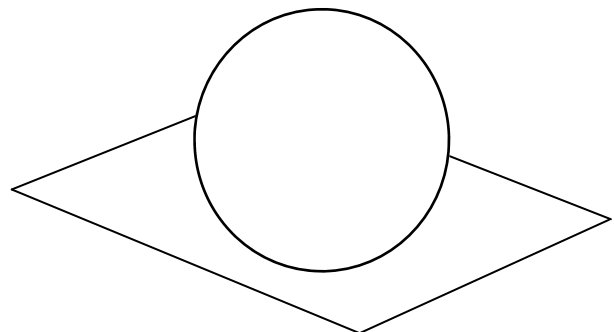
2 **Oil/Gas etc.,– 2 marks**



Chimney stacks

- (o) Apply shading and shadow to the sphere shown to enhance its appearance.

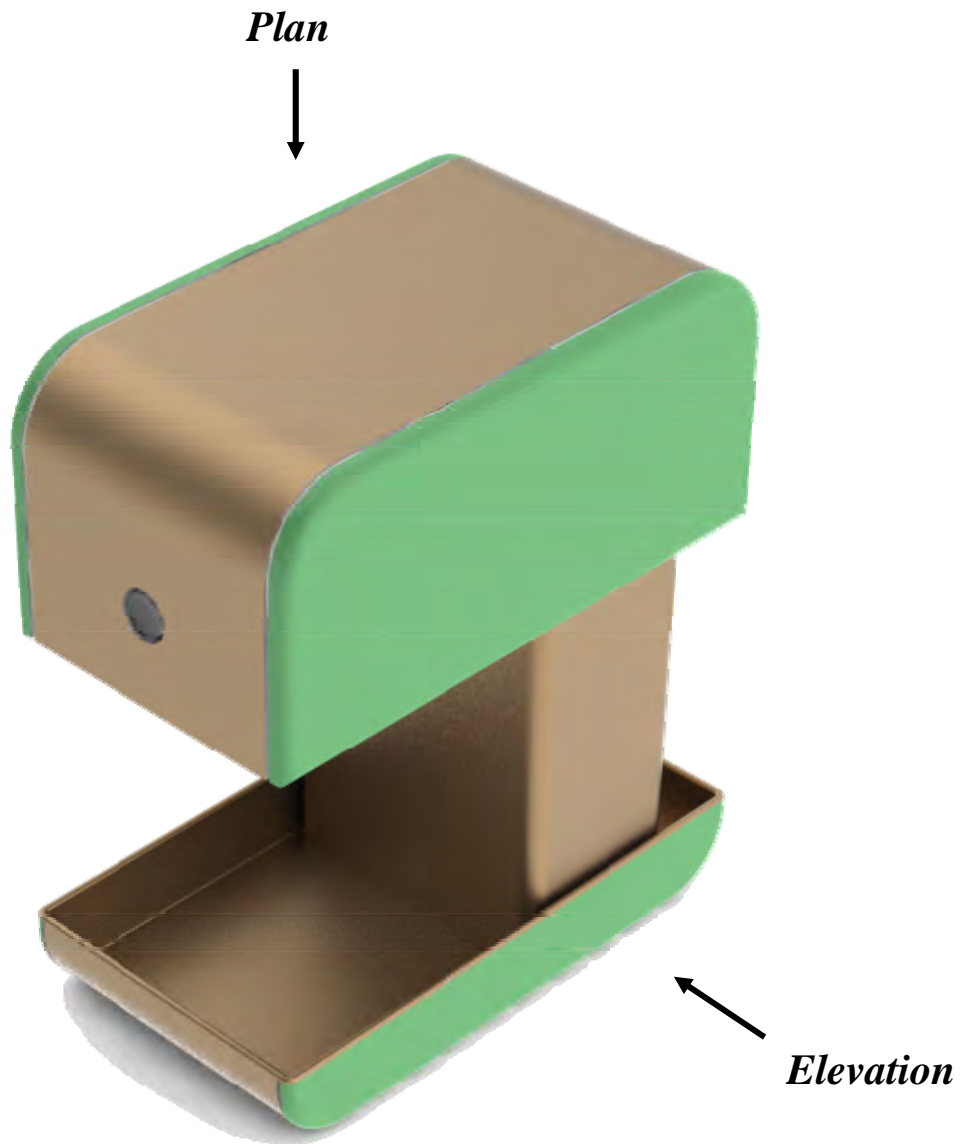
**0-4 marks depending on effort**



**Compulsory**

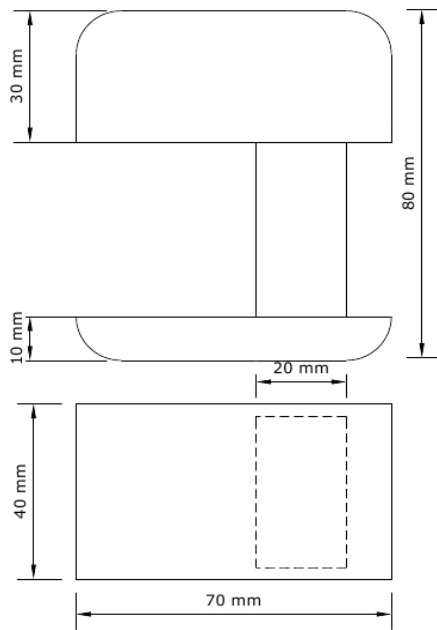
**2. Graphical Communication**

- (a) A solid model 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**





**Elevation = 11 marks**

**End View = 11 marks**

**For each view a sliding scale is applied:**

**Poor = 3 marks**

**Fair = 6 marks**

**Good = 9 marks**

**Excellent = 11 marks**

**Dimensions with dimension lines = 8 marks  
(2 mark each)**

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 **Untidy table -- 2 marks**

---

---

2 **No guard on blade, etc -- 2 marks**

---

---



Table saw

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

1 **Keep cord away from soldering tip -- 2 marks**

---

---

2 **Make sure piece to be soldered is held securely, etc -- 2 marks**

---



Soldering iron and stand

(iii) Wood lacquers tends to be very *volatile*. List **two** safety precautions that should be observed when using them.

1 **Wear a face mask -- 1 marks**

---

2 **Well ventilated area, etc -- 1 marks**

---



Wood Lacquer

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

1 **Clear walkways -- 2 marks**

---

2 **Uncluttered workspace -- 2 marks**

---

3 **Tools stored safely, etc, -- 2 marks**

---

(c) Describe the necessary health and safety precautions that must be taken when carrying out the processes shown opposite.

Plumbing a solder fitting

**No flammable materials near work piece**

**Work piece securely held**

**Protective clothing to be worn, etc.,**

**- Any 2 x 1 mark each**

---

---

Cutting a steel section

**Work piece securely held**

**Goggles to be worn**

**Ear protection to be worn, etc**

**- Any 2 x 1 mark each**



Plumbing a solder fitting



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

**Any 3D representation**

**Poor = 4 marks**

**Fair = 8 marks**

**Good = 12 marks**

**Excellent = 14 marks**



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.

**Any suitable method 0-10 marks depending on details and sketches.**



Letter Holder

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

Answer \_\_\_\_\_

**Cutting material to size—4 marks**

**Round corners and edges—4 marks**

**Secure pieces together, etc.,—4 marks**

---

---

---

---

---

---

---



Vacuum forming mould



Vacuum former

(d) (i) Global warming has become a major problem for the world. Outline **two** negative impacts of global warming.

1 **Increased sea water levels - 4 marks**

---

2 **Increased Desertification, etc., - 3 marks**

---

(ii) Explain the meaning of the following terms:

Renewable energy -**Energy got from wind or sea, does not consume source etc., - 4 marks**

---

Biofuel **Fuel got from plants - 3 marks**

---

---

## 2. Design and Manufacture

(50 marks)

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

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

Answer **Description of any suitable method of Joining such as:**

**Glue together**

**Glue and nail together**

**Glue and screw together - 8 Marks**

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

Name: **Strip heater - 2 marks**

**Mark centre line.**

**Place in position on strip heater**

**Secure**

**Switch on heater for required time.**

**Bend to required angle when soft along line**

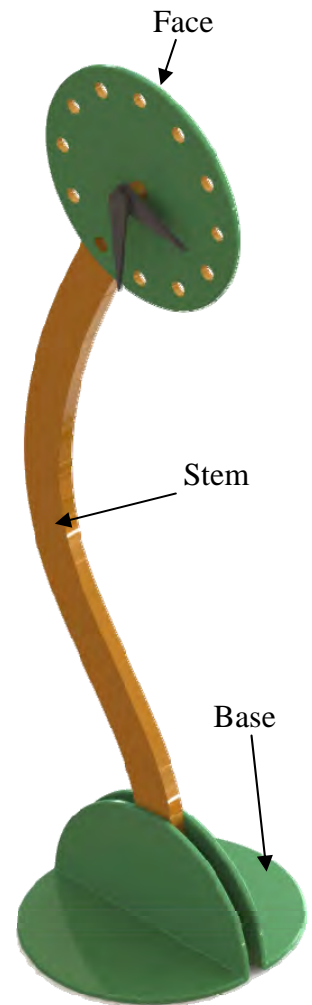
**0-6 depending on detail in answering**

(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 in the lines necessary to locate the centres of the holes and describe an effective method of drilling the holes 'cleanly' in the sheet metal.

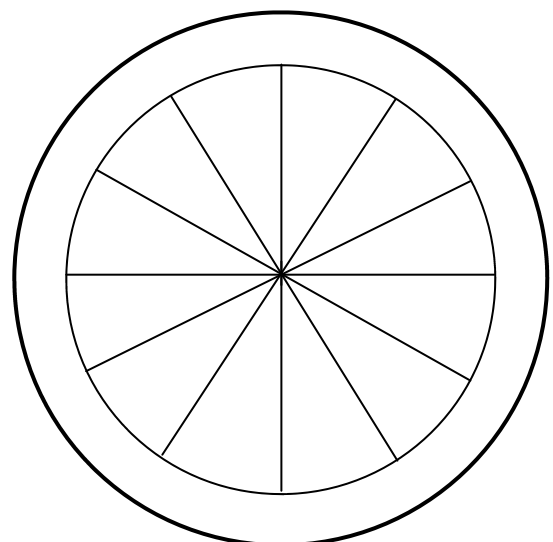
Answer **Lines at 30°/60° - 4 marks**

**Using a drill stand with a sharp bit, piece of wood underneath and hold piece securely, drill out holes**

**0-6 depending on detail in answering**



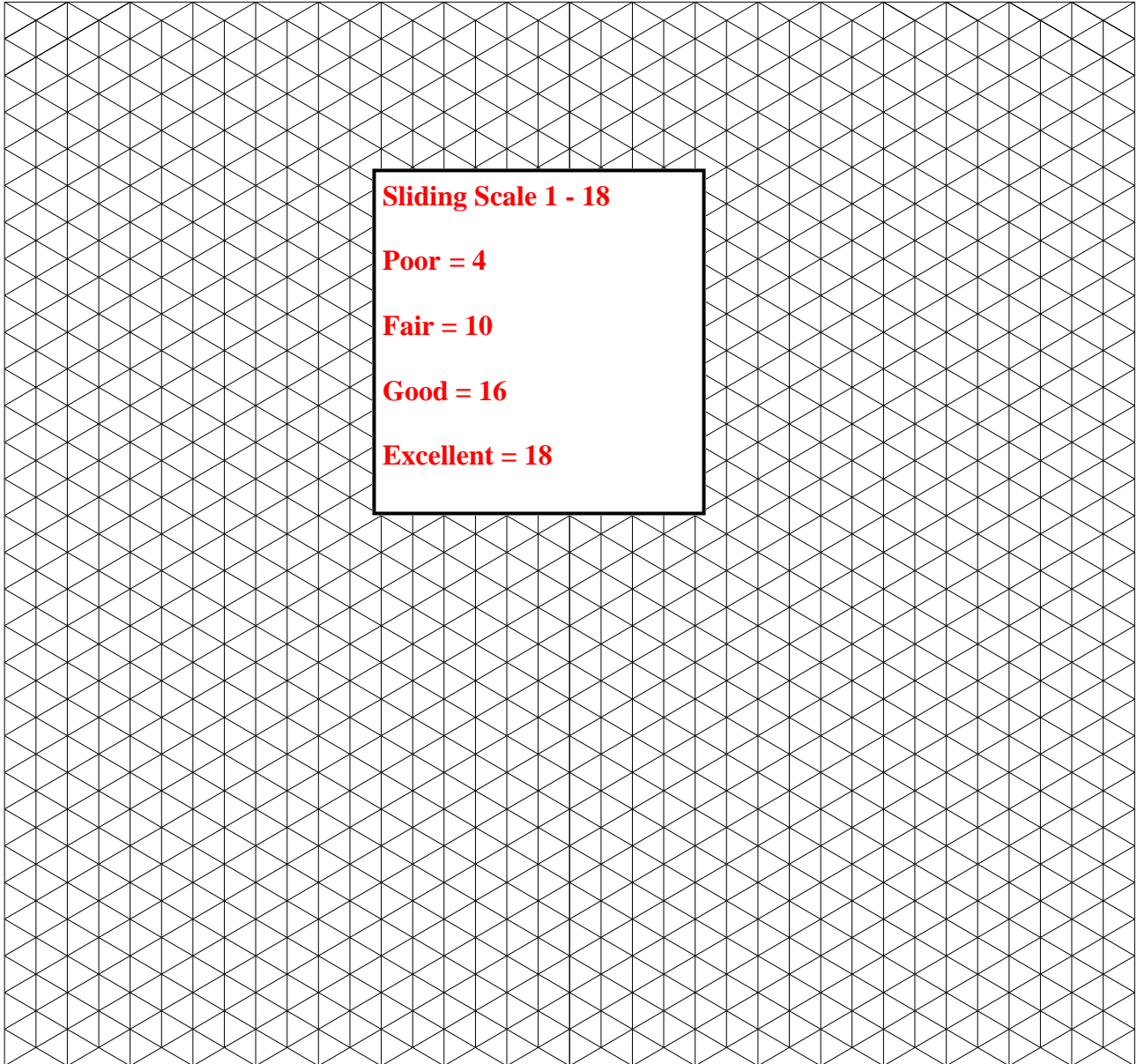
**Clock**



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

Product Name **Name: 2 marks**

---



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

Material 1 **Impact 1 -2 Marks**

---

Material 2 **Impact 2 - 2 Marks**

---

### 3. Water Technology

(50 marks)

- (a) (i) Describe **two** sources of water pollution in our reservoirs.

1 **Agricultural run off - 4 marks**

---

---

2 **Land erosion etc - 4 marks**

---

---



Reservoir

- (ii) Describe briefly, **two** treatment methods used to make water from a reservoir fit for human consumption.

1 **Filtration: in which water is filtered by passing through sand beds - 4 Marks**

---

2 **Addition of chemicals to the water to to purify it etc. - 4 Marks**

---

- (b) Irish Water are installing water meters in the public water supply of every home in the country. Suggest **two** reasons for this initiative.

Reason 1 **Water conservation - 5 marks**

---

---

---

Reason 2 **To pay for the provision of the water etc. - 5 marks**

---

---

---



Water Meter



(c) A circulating pump for a central heating system is shown opposite.

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

**To pump hot water through the system - 4 Marks**

---

---



Central Heating Circulating Pump

(ii) What is the function of a pipe thermostat like that shown opposite in controlling the circulating pump?

**When the water reaches the required temperature the pipe thermostat switches on the circulating pump - 4 Marks**



Pipe Thermostat

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

Name **Pipe cutter. - 2 marks**

Function **Used to cut copper plumbing pipes.- 2 marks**

---



Name **Immersion spanner.- 2 marks**

Function **Used to tighten immersion heater in hot water cylinder housing - 2 marks**



Name **Pipe wrench - 2 marks**

Function **Used for turning soft iron pipes and fittings with a rounded surface. - 2 marks**

---



Name **Plastic pipe cutter. - 2 marks**

Function **Used for cutting plastic pipes - 2 marks**

---



## 4. Electrical Understanding and Electronics

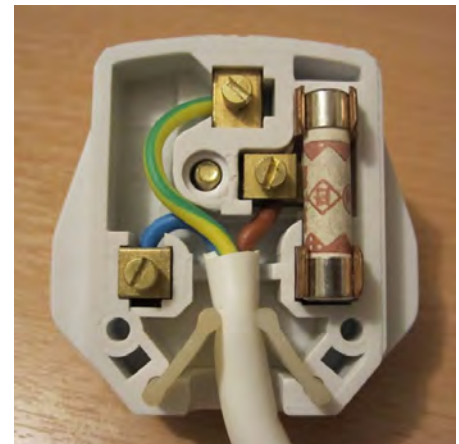
(50 marks)

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

Live **Brown - 2 mark**

Earth **Green and yellow - 2 mark**

Neutral **Blue - 2 mark**



3 Pin Plug

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

- (i) Explain the term LDR.

**LDR Light dependent resistor—3 marks**

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

Function **Switches on the light when it gets dark - 3marks**





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

**0-6 depending on sketch**



Nightlight

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

			
<b>Electrical -2 mks</b>	<b>Electronic -2 mks</b>	<b>Electronic -2 mks</b>	<b>Electrical -2 mks</b>

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

CFL **Compact Fluorescent Light - 3 marks**

Reason **Uses less electricity, lasts longer, less heat - 3 marks**



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

Solution

**Cost = 2kwx12hrsx0.20c = €4.80**  
**Correct formula - 2 marks**  
**Correct answer - 2 marks**



- (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 **Lithium batteries are lighter than other batteries etc. 4 marks**



Electric Car

Electric motor

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

Reason 1 **Unused space otherwise - 3 marks**

Reason 2 **Near to motor etc - 3 marks**

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

AC **Alternating current - 2 marks** DC **Direct current - 2 marks**

## 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	Heat/Hot air gun 3 marks	Stripping paint, desoldering etc. 3 marks
2	Angle grinder 3 marks	Cutting metal or stone. 3marks
3	Dual grinding wheel 3marks	Grinding metal etc. 3marks
4	Air compressor 3 marks	Compresses air for air line tools. 3 marks

(b) Briefly outline **four** stages in the making of this bedside locker. Name a machine or tool used at each stage.

- 1 **Mark wood to size—try square**  
**Cut wood to size—saw**  
**Cut moulding on top and bottom—router**  
**Attach legs to base—drill and screwdriver**
- 2 **Fix top and bottom to sides—drill, dowels & glue**  
**Fix back to unit—panel pins and hammer**  
**Construct drawers—dovetail jig and router**  
**Fix handles to drawer fronts—drill and screwdriver**  
**Fit drawer runners to locker sides and bottom of drawers—Drill and screwdriver**
- 3

**Any 4 stages 4 x 2 marks**

**Any 4 tools - 4 x 1 mark**



Bedside Locker

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

Try square	Sliding bevel	Plane	Tenon saw	Hacksaw
				
		<b>Any 4 x 2marks each</b>		

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

(i) Name a suitable plastic for thermo-forming.

Answer **Any thermoplastic such as acrylic, HIPS etc.**  
**- 2 marks**

(ii) What precautions should be taken when heating plastics in an oven for forming purposes.

**Answer : Ensure that personal protective clothing is worn. Ensure all guards are correctly adjusted and securely fixed. No flammable materials nearby etc - Any 2x2 marks**



Oven for thermo-forming of plastics

**Blank Page**