



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied, 2016

Vocational Specialism - Technology
(240 Marks)

Wednesday 15 June, Afternoon 2:00 to 4:00

General Directions:

1. Write your examination number in this box:

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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)	
	Note: 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	1	
	2	
	3	
Section 2	1	
	2	
	3	
	4	
	5	
Total		

Compulsory

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

(a) Plywood is a very versatile material and can be used in the manufacture of products such as childrens' bikes. Give a reason for using plywood and explain the term plywood.

Reason _____

Plywood _____



Child's Bike

(b) The 'goobag' is a recently developed travel bag that can be collapsed as shown in the image. Suggest **two** good design features of this travel bag.

Feature 1 _____

Feature 2 _____



Collapsible Travel Bag

(c) Bluetooth devices such as the 'Beats' Bluetooth speaker, shown opposite, are becoming popular. Briefly describe what is meant by Bluetooth and suggest one other use for Bluetooth.

Bluetooth _____

Use _____

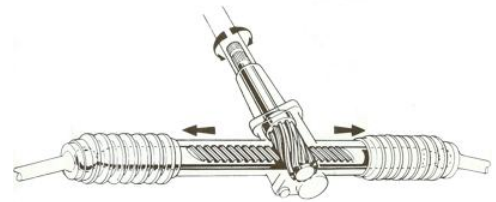


'Beats' Bluetooth speaker

- (d) An image of a car steering mechanism is shown. Name this mechanism and suggest **one** other use for this type of mechanism.

Name _____

Other use _____



Car steering mechanism

- (e) Car bodies typically include many curved panels. Suggest **two** reasons for this.

Reason 1 _____

Reason 2 _____



Car Body

- (f) Complete the table by naming a unit of measurement in each case.

Quantity	Computer Memory	Tyre Pressure	Area	Mass
Unit				

- (g) A kit which can be used to build a variety of bikes and trikes has been developed by 'Infento'. Suggest a suitable material for each of the following parts:

Frame _____

Wheel hubs _____

Handlebar grips _____

Chain _____



Infento Constructible Trike

(h) Advances in computer software and printing technology has made it possible to produce toys and even car components using 3D printers.
Suggest **two** advantages of 3D printing.

1 _____

2 _____



3D Printed Car

(i) Describe the function of a corrosion inhibitor in a central heating system.

Function _____



Corrosion inhibitor

(j) The device shown opposite is often fitted in the plumbing system of a house. Name the device and state where it is located in the plumbing system.

Name _____

Location _____



(k) Tablet computers have become popular. Name **two** design features of these tablets which make them user friendly.

1 _____

2 _____



Tablet computer

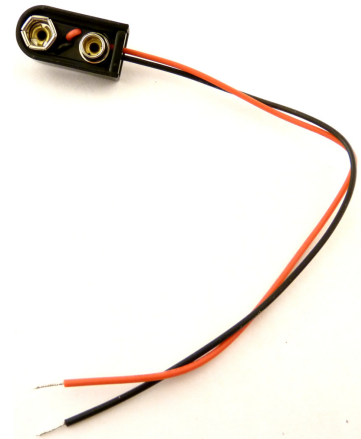
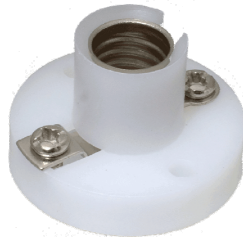
- (l) Calculate the cost of running a 0.1 kW backlit LCD display for 10 hours if a unit of electricity costs 22 cent.

Calculation



Backlit LCD display

- (m) Draw the electrical wire connections so that a bulb, when placed in the bulb holder, can be switched on/off using the switch when the battery snap is connected to a power supply.



- (n) Give **two** reasons why old mobile phones should not be disposed of in a landfill site.

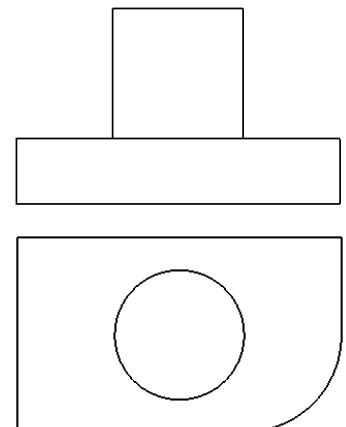
- 1 _____

 2 _____



- (o) The Elevation and Plan of a machine part are shown.
 In the space provided, make a 3D sketch of the part.

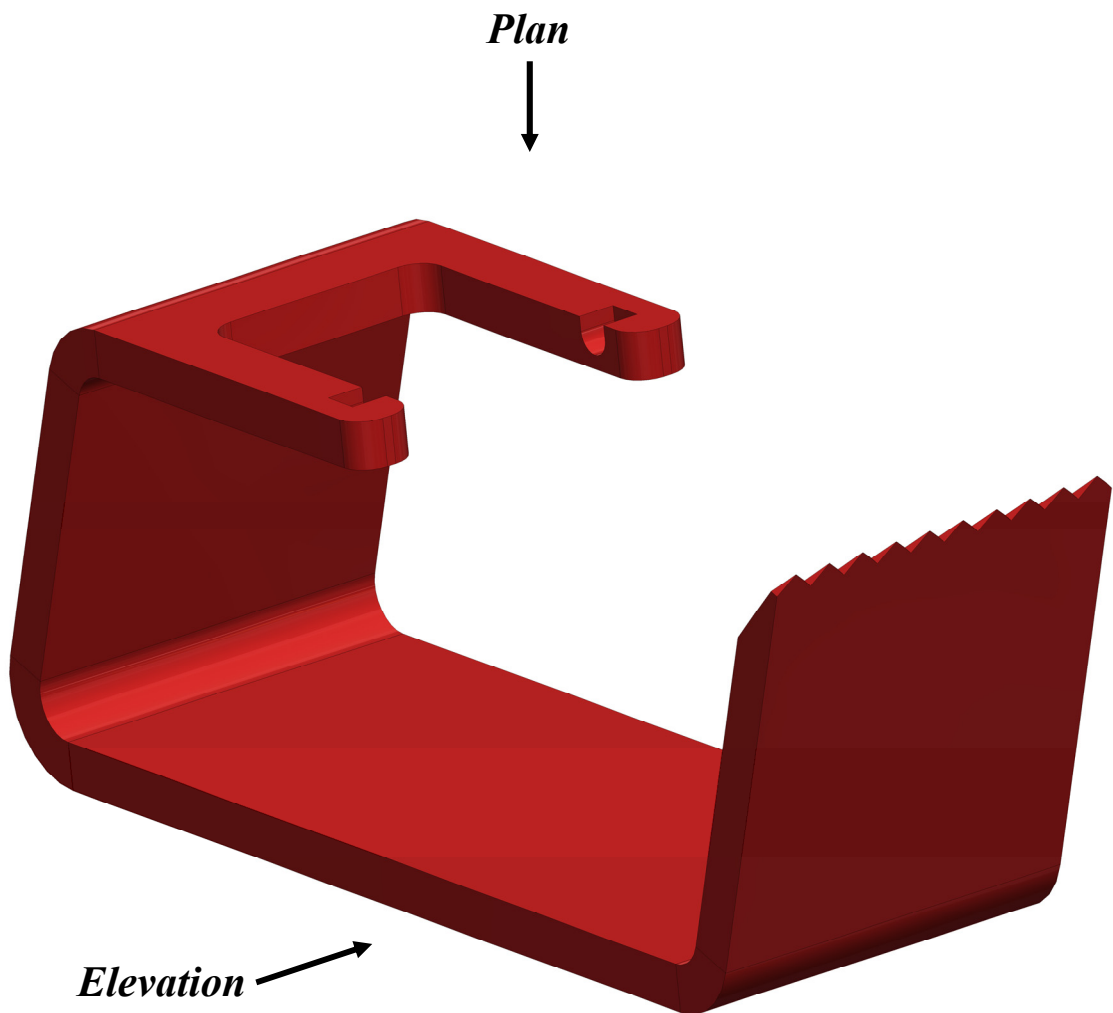
3D Sketch



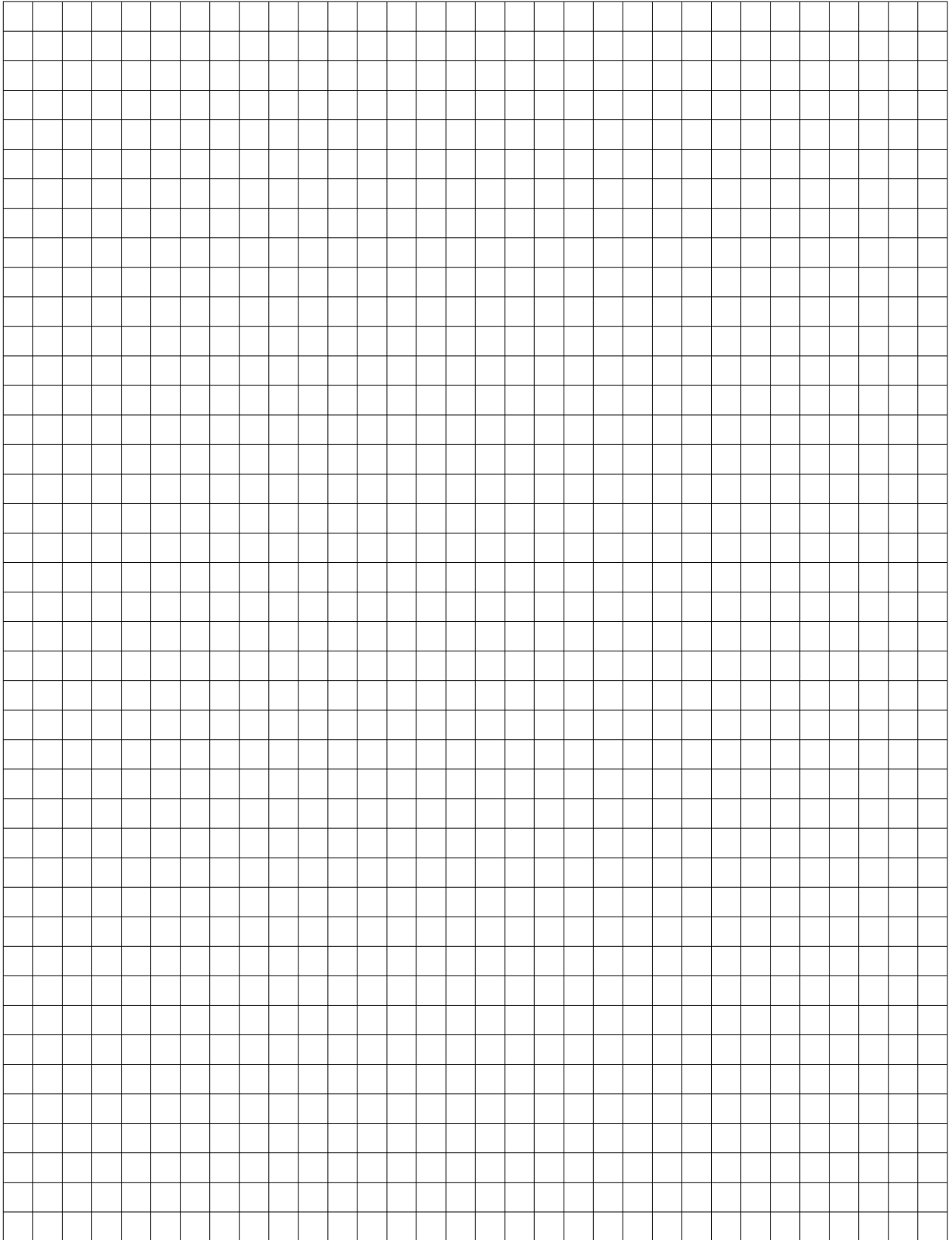
Compulsory

2. Graphical Communication

- (a) A CAD solid model of the body of a sellotape dispenser is shown below. In the space opposite draw a well proportioned Elevation and Plan of the tape dispenser.
- (b) Estimate 4 dimensions and include them on your completed drawing.



Sellotape Dispenser Body



Estimate 4 dimensions and include them on your completed drawing.

Compulsory

3. Health and Safety

(a) (i) A safety device to be used in a school workshop is shown below. Name this device and give **two** examples of where it could be used to help prevent injury.

Name _____

Use 1 _____

Use 2 _____

(ii) An image of a chop saw is shown. Describe **one** significant safety feature of this saw.

Answer _____



Safety Device



Chop Saw

(b) The picture opposite shows a person ripping a length of wood in an unsafe manner.

(i) What safety precaution is **not** being observed here?

Answer _____

(ii) State the purpose of the riving knife.

Purpose _____

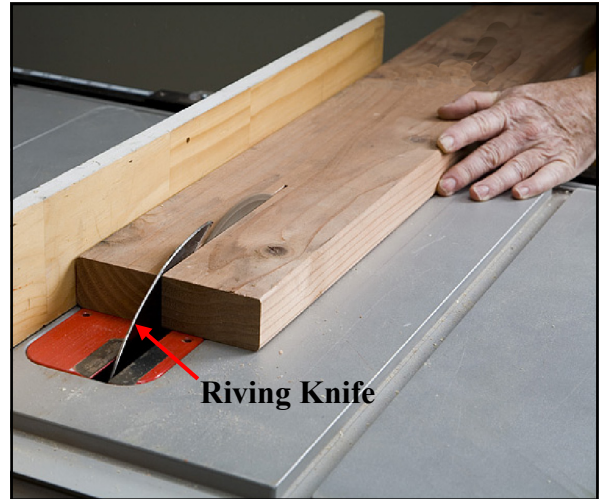
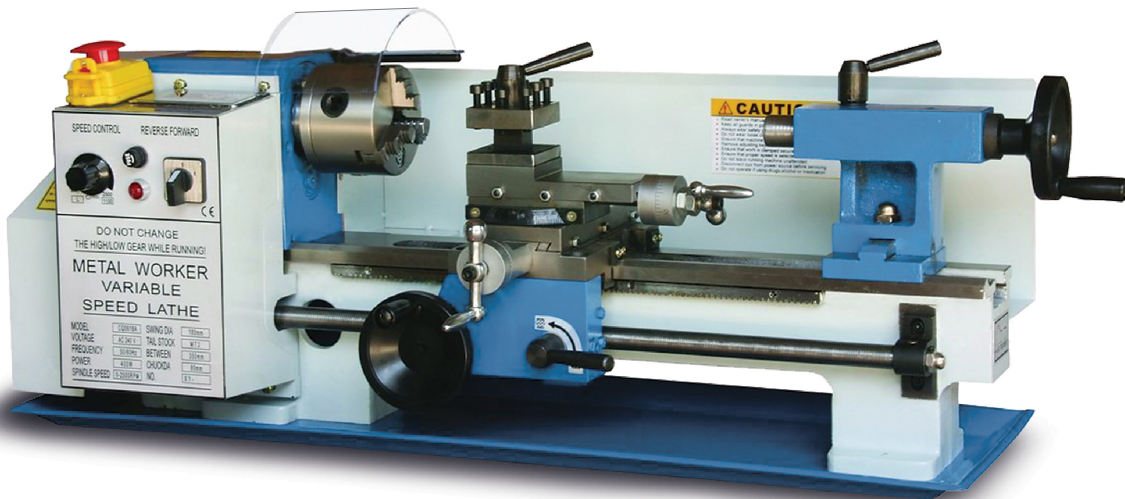


Table Saw



(c) A bench-mounted lathe is shown above.

(i) Describe **two** safety features of this lathe.

Safety Feature 1 _____

Safety Feature 2 _____

(ii) Describe **one** significant safety precaution that should be observed by a person using a lathe such as this.

Answer _____

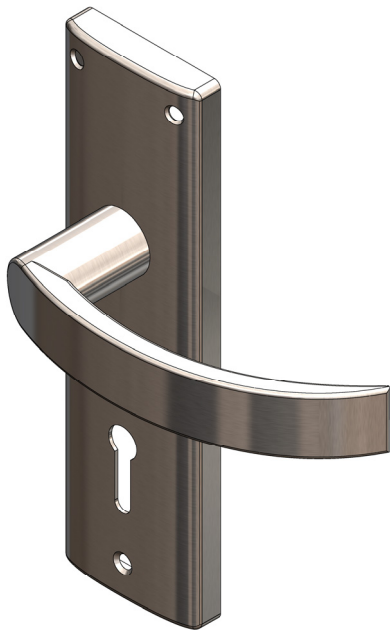
Section 2 (150 marks)

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

1. Introducing Technology

(50 marks)

- (a) An image of a steel door handle is shown. In the space below make a 3D sketch of the door handle and apply appropriate shading.



Steel Door handle

3D Sketch

- (b) A tinted photograph holder made in the Technology workshop is shown.

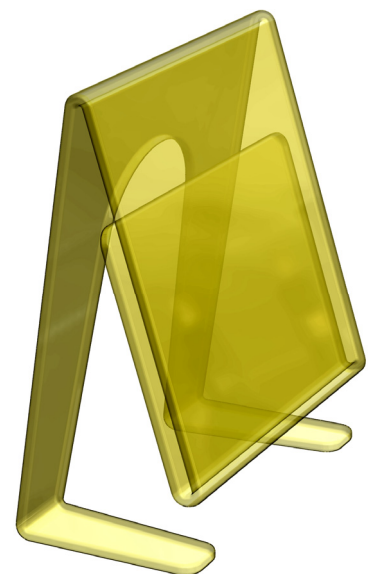
- (i) Suggest a suitable material for the photograph holder and give a reason for your choice.

Material _____

Reason _____

- (ii) Describe how to bend the material.

Answer _____



Tinted Photograph Holder

(c) A design for a child's wooden toy plane is shown. The plane is made from hardwood.

(i) Name a suitable hardwood for the plane.

Hardwood _____

(ii) Name a machine that could be used to make the wooden fuselage.

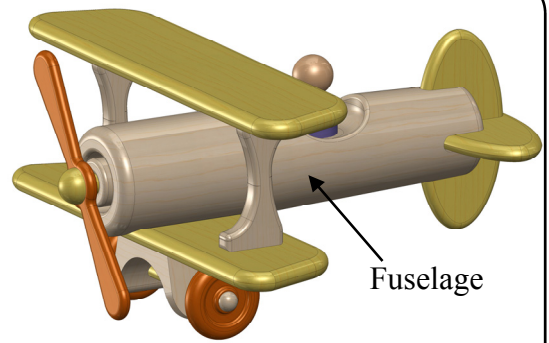
Machine _____

(iii) The exploded view shows the jointing method used to join the wing to the support. Name this method as shown circled in red.

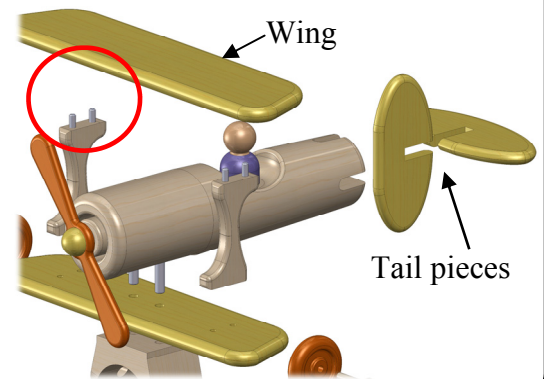
Method _____

(iv) Name the joint used to join the tail pieces to each other.

Joint name _____



Wooden Toy Plane



(d) Robotics play a key role in car manufacturing and in industry generally.

(i) Suggest **two** processes performed by robots in the manufacture of a car.

1 _____

2 _____

(ii) In a factory where all manufacturing is done using robotic devices, suggest **two** roles for human workers in the factory.

1 _____

2 _____

(iii) Outline **two** advantages of using robots in manufacture.

1 _____

2 _____

2. Design and Manufacture

(50 marks)

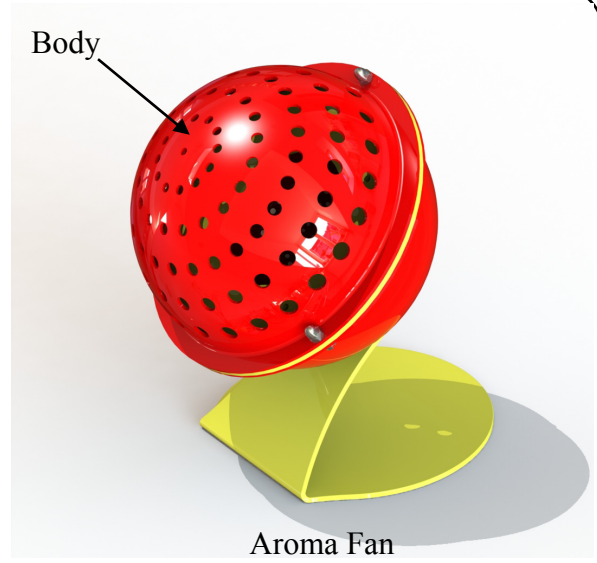
(a) An Aroma fan, into which pot-pourri is placed, uses an internal fan to radiate the fragrance of the pot-pourri. High Impact Polystyrene (HIPS) is used to make the spherical body of the product.

(i) Name a suitable machine that could be used to form the hemispherical parts of the product.

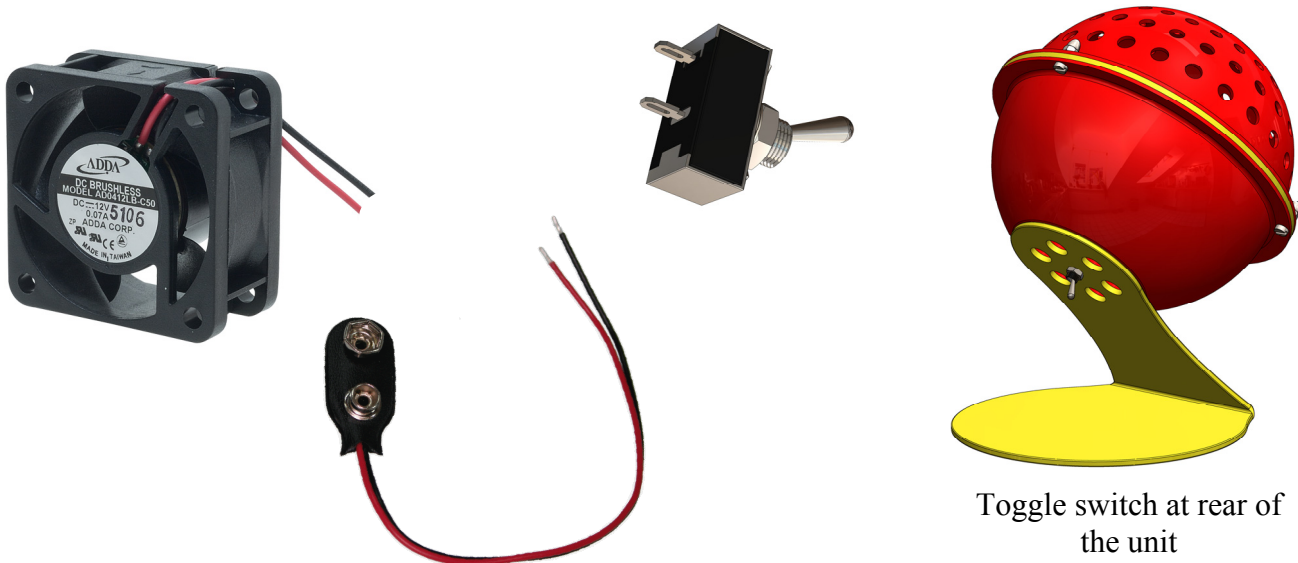
Answer _____

(ii) Explain the main steps in the process of forming the plastic into hemispheres.

Process _____

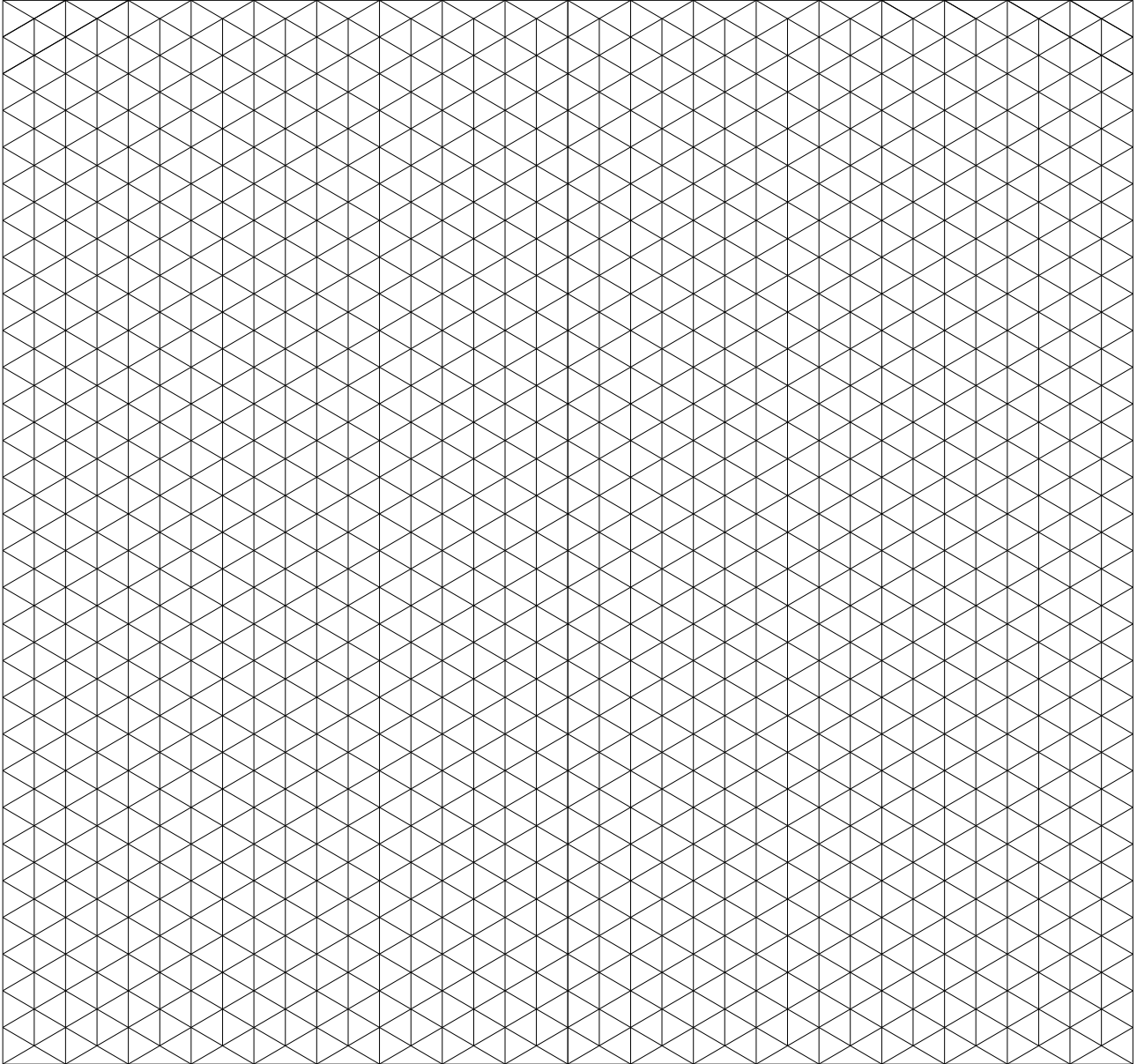


(b) The components needed for the fan circuit are: an axial fan, a battery snap and a toggle switch. Draw the wire connections so that the fan can be controlled by the switch.



- (c) (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 on the grid below.

Product Name _____



- (ii) State in what way your product is **OR** is not environmentally friendly.

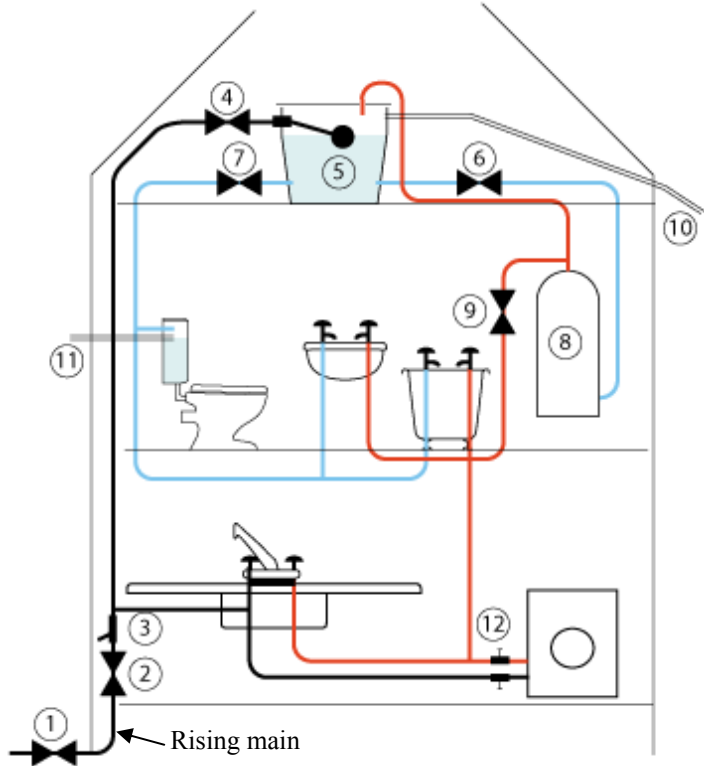
3. Water Technology

(50 marks)

(a) An illustration of the hot and cold water supply system in a house is shown.

(i) Explain why the kitchen sink receives the cold water supply directly from the rising main.

Answer _____



(ii) State the function of **each** of the following numbered elements of the system.

1 _____


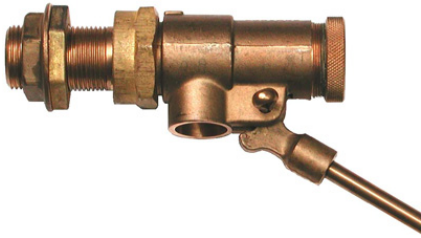


5 _____

7 _____

8 _____

10 _____

(b) Describe the function of **each** of the fittings shown in the space provided.

1 _____ _____ _____	
2 _____ _____ _____	
3 _____ _____ _____	
4 _____ _____ _____	

(c) Describe the basic operation of a water tower in the water supply system of a town or city.

Answer _____



Typical Water Towers

4. Electrical Understanding and Electronics

(50 marks)

(a) Pictures of a domestic electric shower and of a pumped electric shower are shown.

(i) How does an 'electric shower' differ from a 'pumped electric shower'?

Answer _____



Electric Shower

(ii) Which of these shower units consumes the most electricity? Give a reason for your answer.


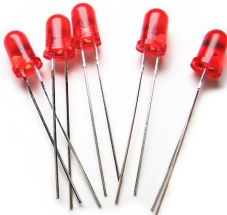
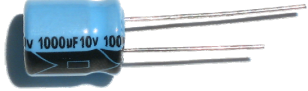
Answer _____

Reason _____



Pumped Electric Shower

(b) Name the electronic components shown in the table below and draw the corresponding symbol for each.

Component			
Name			
Symbol			

(c) A domestic electricity meter reading was recorded as 30924 units (kWh) at the end of a particular billing period. Two months later the reading was 31480 units.



(i) How many units were consumed in the two month period?

Answer _____

(ii) Calculate the bill (in Euro) if the unit cost was 16 cent.

Calculation:

(iii) If the VAT rate is 10%, calculate the electricity bill to the nearest Euro when the VAT is added to the bill?

Calculation:

(d) Domestic and small business type wind turbines are becoming popular for electricity generation.

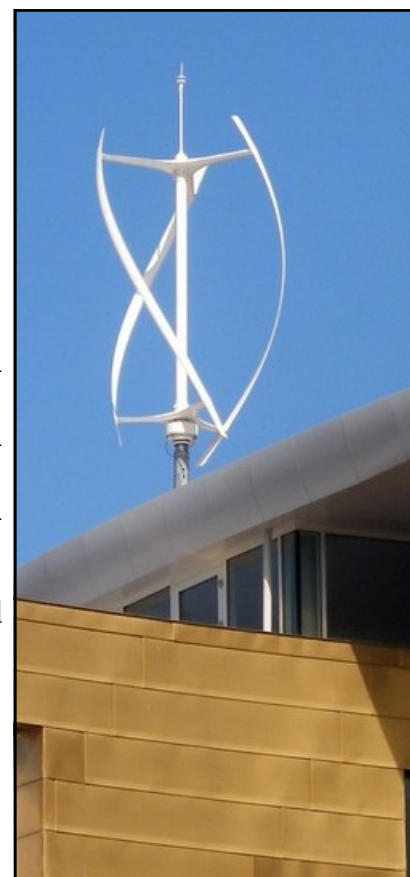
A 'Gorlov' type vertical axis wind turbine is shown.

(i) Outline an advantage of using this type of turbine compared to a typical three blade propeller type turbine.

Advantage _____

(ii) When spinning on a given day, the power generated by this turbine was 2100W (2.1kW). If the voltage produced was transformed to 240 Volts, calculate the current available.

Calculation
Note: $Power = Voltage \times Current$ ($P = V \times I$)



Vertical axis wind turbine

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) Building electronic circuits requires the use of specialist tools. Name **each** of the tools shown and state its purpose in circuit building.

Tool **A**

Name _____

Purpose _____

A



Tool **B**

Name _____

Purpose _____

B



Tool **C**

Name _____

Purpose _____

C



(c) Make a sketch of **any 3** of the following tools in the spaces provided.

Try Square	Scriber	Countersink Bit	Mallet

Blank Page