



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2011

Vocational Specialism - Technology
(240 Marks)

Wednesday 15th 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)	
	<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	1	
	2	
	3	
Section 2	1	
	2	
	3	
	4	
	5	
Total		

Question 1

Compulsory

(40 marks)

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

(a) The graphic shows iron objects that have iron oxide on their surfaces. What is iron oxide more commonly known as?

Answer _____

How can the formation of iron oxide be avoided?



(b) Suggest **two** possible uses for robotics in modern industry.



Use 1 _____

Use 2 _____

(c) Computer Aided Design and Computer Aided Manufacture (CAD/CAM) machines like routers and laser cutters are very useful in workshops.

Suggest **two** advantages of these machines over traditional manufacturing methods.

1 _____

2 _____



CAD/CAM Router

- (d) Infrared remote controls are widely used for controlling electronic products.
Name **three** products that they are commonly used to control.



- 1 _____
2 _____
3 _____

- (e) Much water is wasted in today's society.
Suggest **two** ways in which technology has been used to help prevent water wastage.



- 1 _____

- 2 _____

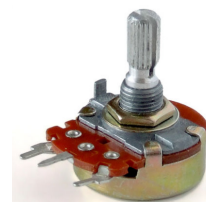
- (f) The metre is a unit of distance. What are each of the following units used to measure?

Metre (m)	Kilogram (kg)	Litre (L)	Newton (N)	Gigabyte (GB)
Distance				

- (g) The two components **A** and **B** shown opposite were used in the manufacture of an indoor water fountain.
Name these components.

Component **A** _____

Component **B** _____



Component **A**



Component **B**

- (h) An external hard drive for a computer is shown.
List **two** uses for external hard drives.

Use 1 _____

Use 2 _____



External Hard Drive

- (i) A drain cock used in plumbing systems is shown.
Give an example of where this fitting is used in a typical domestic plumbing system.

Where used _____



Drain cock

- (j) Name the product shown **and** say where it is fitted in the hot water system of a house.

Name _____

Where fitted _____



- (k) In the space below, calculate the cost of running this 1.5kW microwave oven for 6 minutes if one unit of electricity costs €0.20.



(l) Electrical power stations produce AC electricity as opposed to DC electricity.

What do the abbreviations AC and DC stand for ?

AC _____

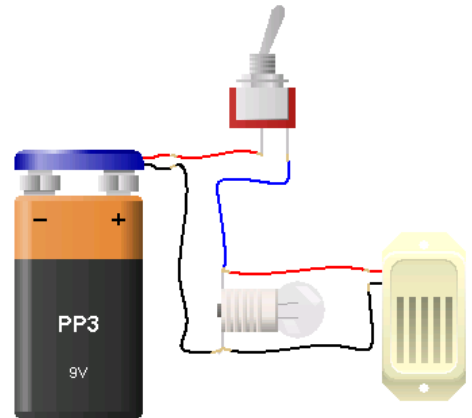
DC _____



Moneypoint Power station

(m) A circuit to switch on a bulb and a buzzer in parallel is shown. Draw the corresponding circuit diagram below.

Circuit diagram



(n) Name the machine used to make these rounded metal parts and state **one** safety precaution when using it.

Name _____

Precaution _____



(o) Product design is a very important part of the manufacturing industry.

When designing the toaster shown, list **two** things that the designer had to take into consideration.

1 _____

2 _____

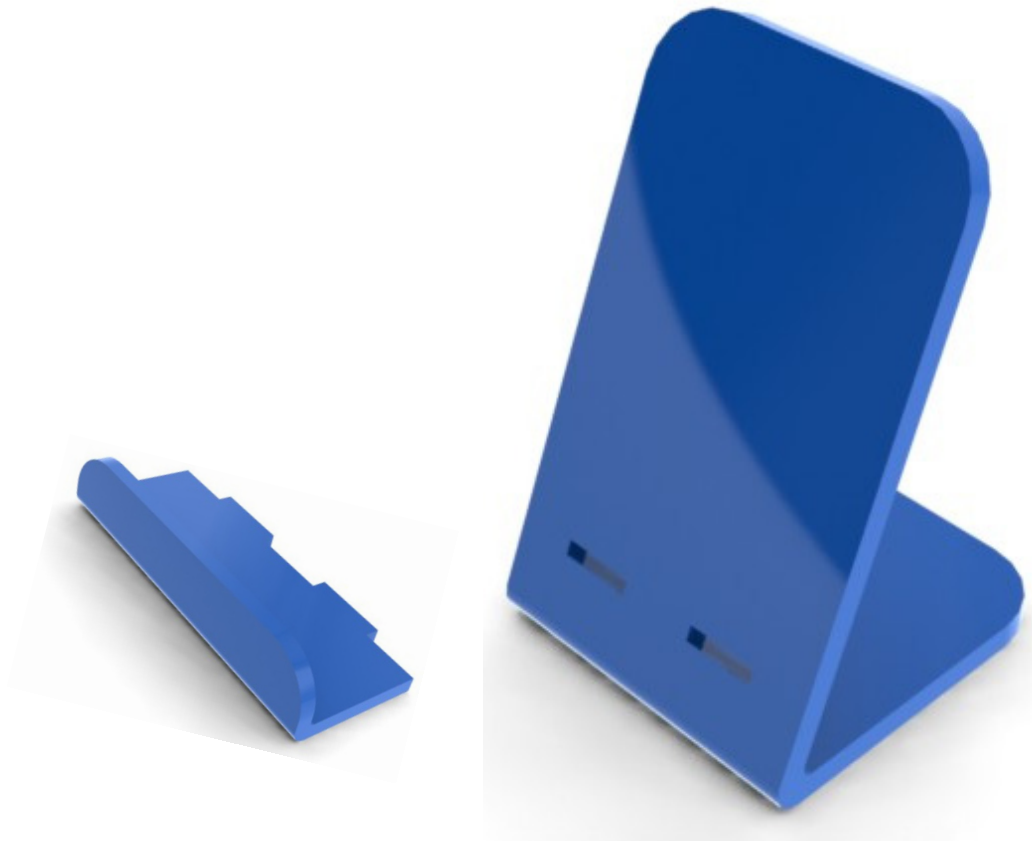


Electric toaster

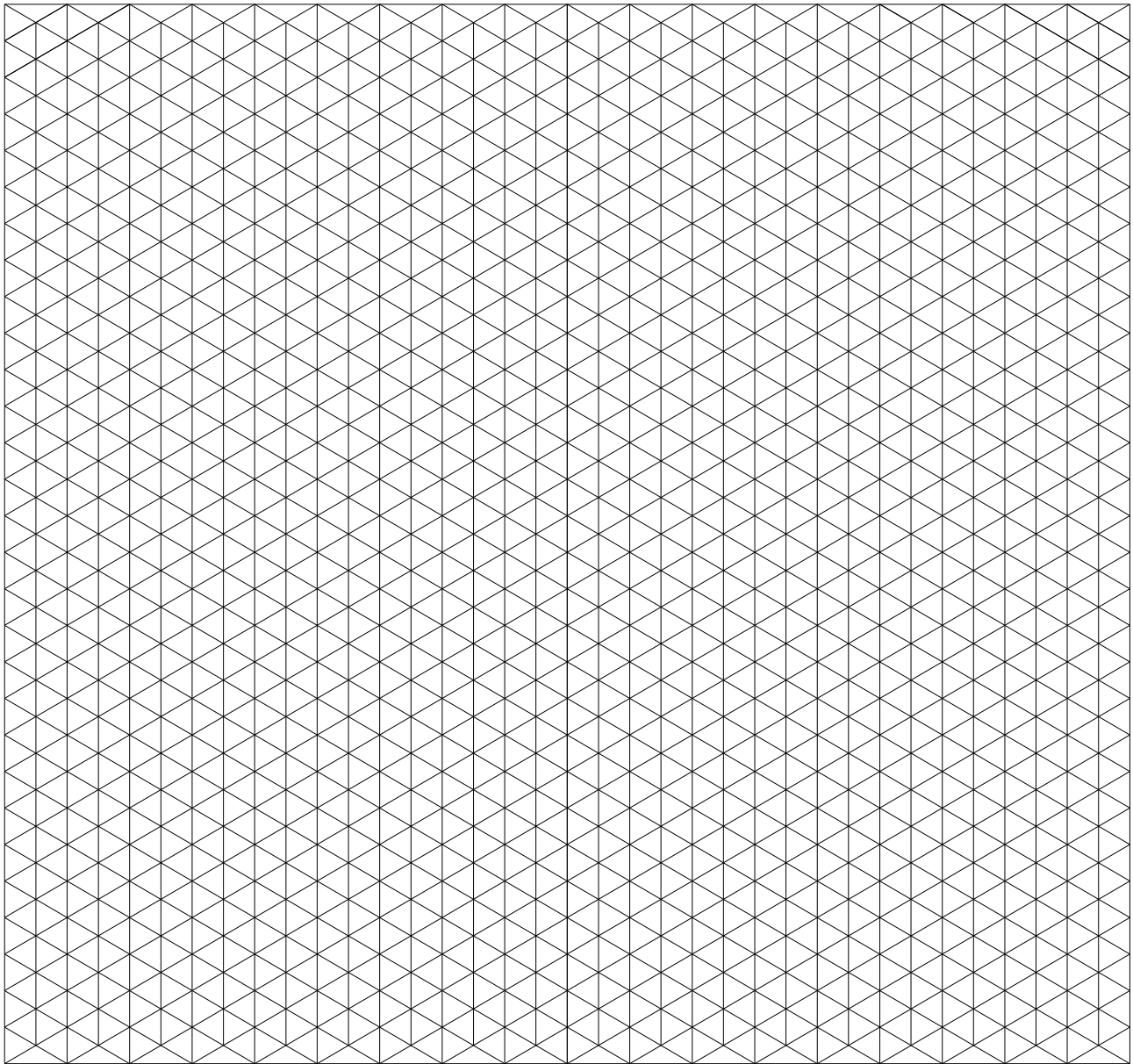
Compulsory

2. Graphical Communication

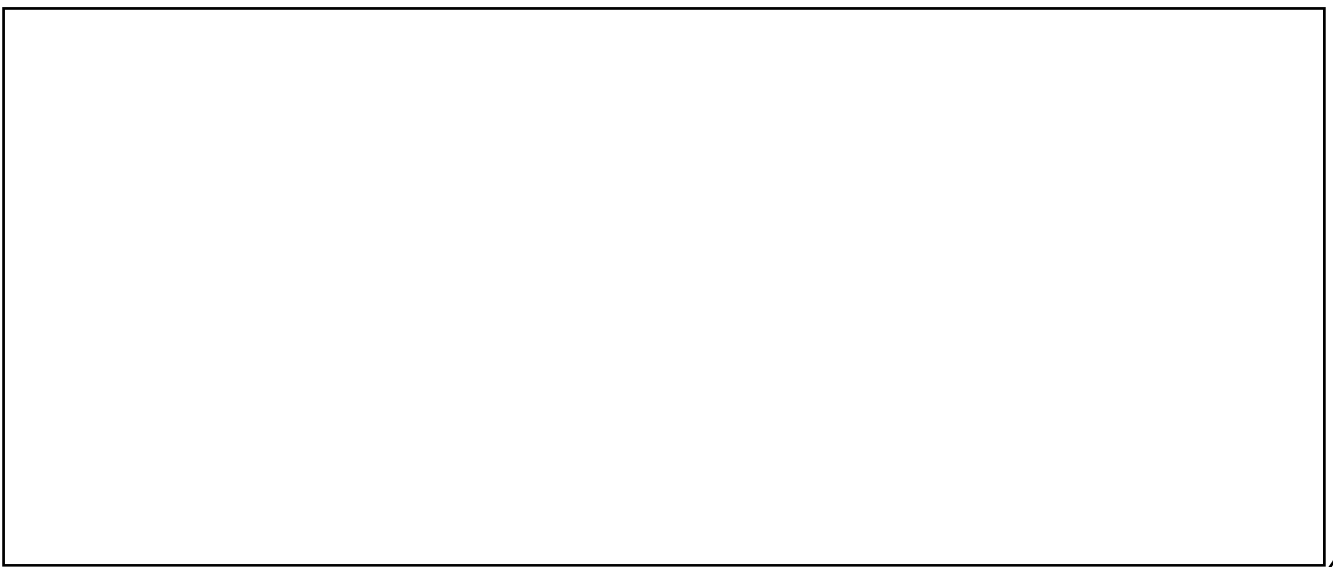
- (a) An exploded view of a business card display unit is shown below.
On the page opposite make a well proportioned isometric sketch of the **assembled** unit.
Use shading to enhance your sketch.



Exploded view of a business card display unit



(b) In the space below sketch the development of **each** part of the business card display unit.



Compulsory

3. Health and Safety

(a) (i) Suggest **two** instances in the workshop when it would be wise for someone to “hit” the emergency stop button.

1 _____

2 _____



(ii) List **two** precautions that should be observed when using an extension lead to power hand held power tools.

1 _____

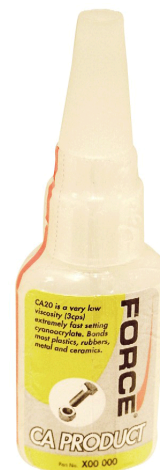
2 _____



(iii) List **two** precautions that you should take when using superglue to glue parts together.

1 _____

2 _____



(b) Two safety signs are shown below.
List **two** situations when the instruction on each of these signs should be carried out.

Sign A



Sign A

- 1 _____
2 _____



Sign B

- 1 _____
2 _____

Sign B

(c) When using **each** of the machines/tools below list **two** safety precautions which should be observed.

(i) Angle Grinder

- 1 _____

2 _____



Angle Grinder

(ii) Strip Heater

- 1 _____

2 _____



Strip Heater

(iii) Chop Saw

- 1 _____

2 _____



Chop Saw

Section 2 (150 marks)

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

1. Introducing Technology

(50 marks)

- (a) A miniature DC motor is shown.
Make a 3D sketch of the motor and apply shading to enhance your sketch.

3D Sketch



Miniature DC motor

- (b) A DVD rack made from MDF is shown.

- (i) Explain the term MDF.

Answer _____

- (ii) Explain how you would achieve a good painted surface finish on MDF.

- (iii) Name a tool that could be used to produce the circular holes for the handles at the top of the rack.

Answer _____



(c) (i) Explain the steps needed to produce a smooth finish on the edge of a piece of acrylic after it has been cut using a bandsaw.

Answer _____



(ii) Use arrows to indicate the most appropriate glue for gluing the following materials:

Wood to Wood
Acrylic to Acrylic
Acrylic to Metal

Methylene Chloride (Tensol Cement)
Contact Adhesive
Polyvinyl Chloride (PVA)

(d) Name **each** fitting shown below and suggest **one** appropriate use for each.

(i) Name _____
 Use _____



(ii) Name _____
 Use _____



(iii) Name _____
 Use _____



(iv) Name _____
 Use _____



2. Design and Manufacture

(50 marks)

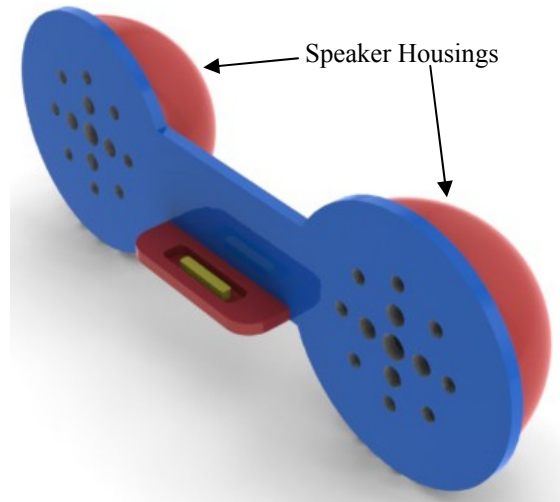
(a) An MP3 player docking station is shown opposite.

(i) Name a type of plastic suitable for the front of the unit and give **two** reasons for your choice.

Suitable Plastic _____

Reason 1 _____

Reason 2 _____



MP3 Player Docking Station

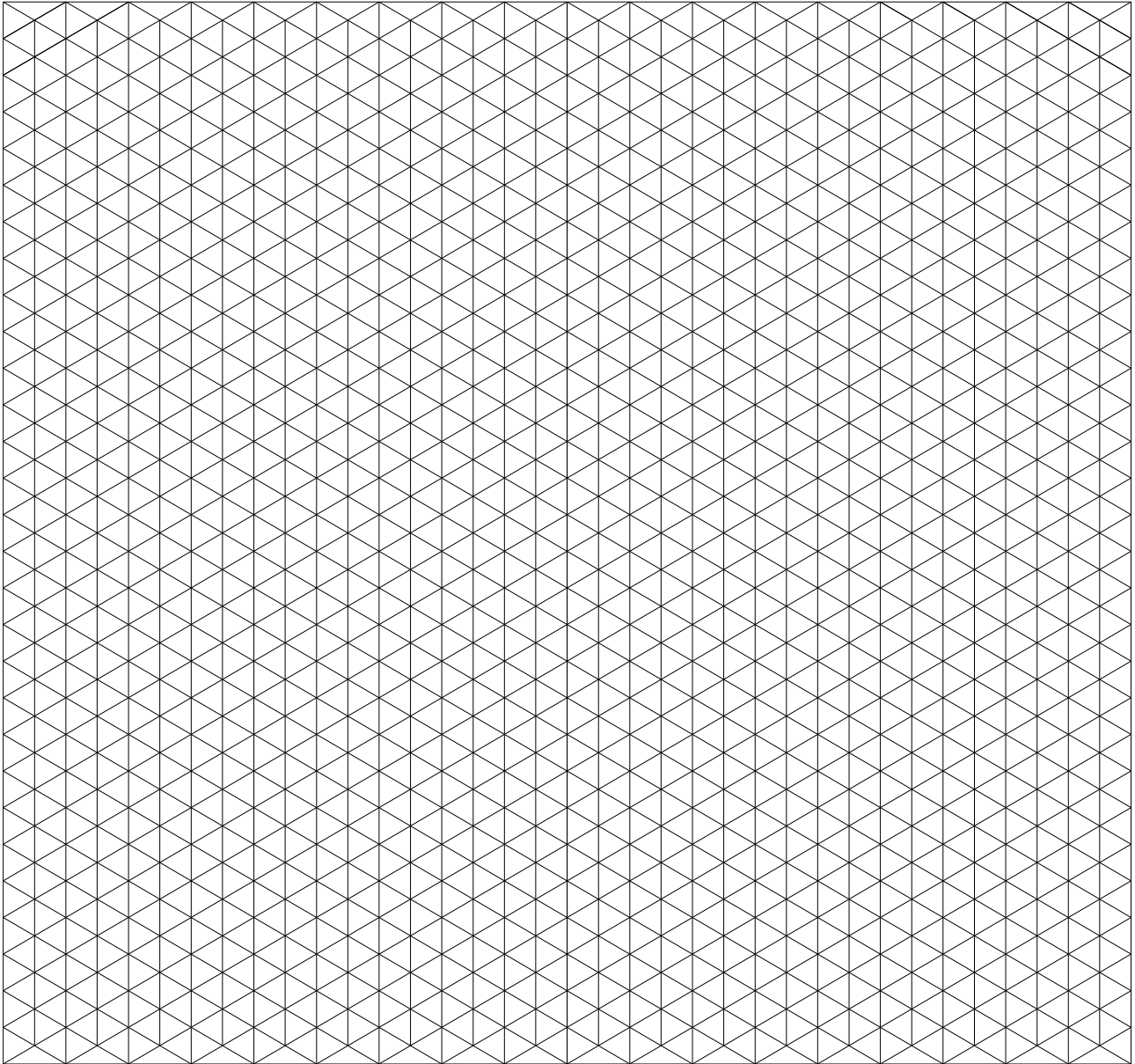
(ii) The housings for the speakers are hemispheres made from high impact polystyrene (HIP). Explain the process involved in making these housings.

Explanation _____

(iii) In the space below sketch an alternative design for a docking station.

- (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 on the grid below.

Product Name _____



- (ii) What were the **two** biggest difficulties that you overcame while making this product.

1 _____

2 _____

3. Water Technology

(50 marks)

- (a) In relation to the waste water system in a house, give an example of where **each** of the fittings shown would be used.

Fitting 1 _____

Fitting 2 _____

Fitting 3 _____



- (b) Give a step by step description of the procedure used to glue (weld) a PVC waste pipe to a fitting such as that shown.

Procedure _____



Fitting



Waste Pipe

(c) Suggest **two** reasons why plastic piping has become more popular than traditional copper piping in domestic hot and cold water systems.

Reason 1 _____



Reason 2 _____



(d) An image of a 6V water pump is shown opposite. This pump is submersible and is to be used for a small indoor fountain.

(i) Explain the term “submersible”.

Answer _____



Submersible water pump

(ii) State **two** important characteristics of a submersible water pump.

1 _____

2 _____

(iii) In the space opposite make a sketch of your design for a small indoor water fountain.

4. Electrical Understanding and Electronics

(50 marks)

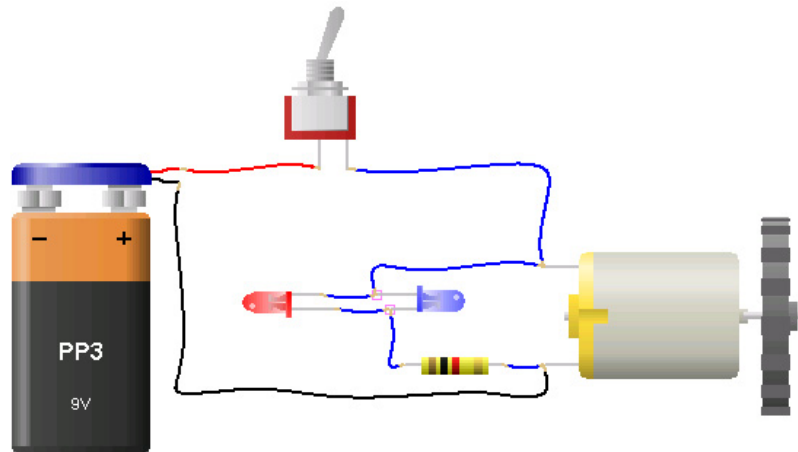
(a) In the spaces below make a sketch of **each** of the electronic components listed.

Sketch					
Name	Resistor	LDR	Micro-switch	Capacitor	Transistor

(b) A circuit to drive a motor with a gear attached is shown. Two LEDs are shown in parallel with the motor.

(i) Suggest which LED will light in this circuit and explain why.

Answer: _____



(ii) Using the correct symbols for the components draw the circuit diagram for this circuit.

Circuit diagram

- (c) (i) A copper earth rod is shown.
 What is the function of an earth rod?
 Why is copper is a suitable material for earth rods?



Earth Rod

Function _____

Why copper? _____

- (ii) Calculate the power consumption of this portable DVD player if the operating voltage is 9V and the current is 1.2 Amps.

Calculation



- (iii) Calculate the cost of operating a 1.4kW Dyson Airblade hand drier for a combined running time of 10 hours if the cost per unit of electricity is 20 cent (€0.20).

Calculation



- (iv) Micro-generation refers to the means by which people can generate their own electricity to reduce their own electrical costs and help the environment.
 Describe **two** ways in which this can be done.

Method 1 _____

Method 2 _____

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) List **three** characteristics of a good quality workbench.

- 1 _____
- _____
- 2 _____
- _____
- 3 _____

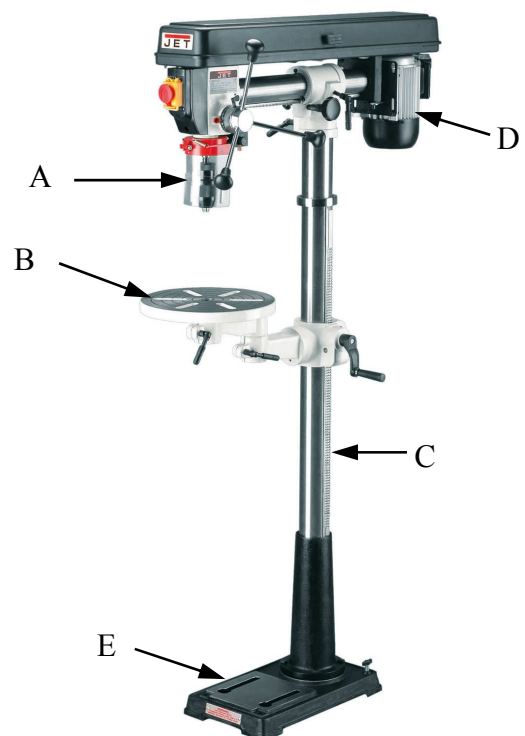


(c) Make sketches of **any 4** of the following tools in the spaces below.

Adjustable Spanner	Long-nose Pliers	Claw Hammer	Pipe Cutter	Spring Dividers

(d) Name the parts indicated on the pillar drill shown below.

- A _____
- B _____
- C _____
- D _____
- E _____



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