



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2011

Marking Scheme

Technology

Common Level



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:

| |
|--|
| |
|--|

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 surface. What is iron oxide more commonly known as?

Answer **2 mks.**

How can the formation of iron oxide be avoided?

2 mks.



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



Use 1 **2 mks.**

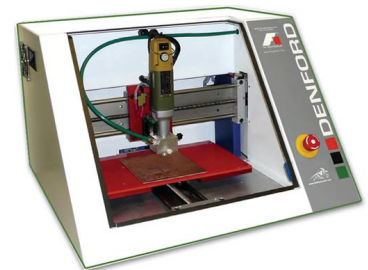
Use 2 **2 mks.**

(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 mks.**

2 **2 mks.**



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 mks.**
- 2 **1 mk.**
- 3 **1 mk.**

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



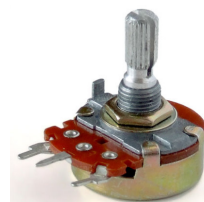
- 1 **2 mks.**

- 2 **2 mks.**

(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 | | | 1 mark each | |

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



- Component **A** **2 mks.**
- Component **B** **2 mks.**

Component A

Component B

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

Use 1 **2 mks.**

Use 2 **2 mks.**



External Hard Drive

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

Use **4 mks.**



Drain cock

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

Name **2 mks.**

Where fitted **2 mks.**



- (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.

2 mks. for formula.
2 mks. for correct answer



- (l) Electrical power stations produce AC electricity as opposed to DC electricity.
What do the abbreviations AC and DC stand for ?

AC **2 mks.**

DC **2 mks.**

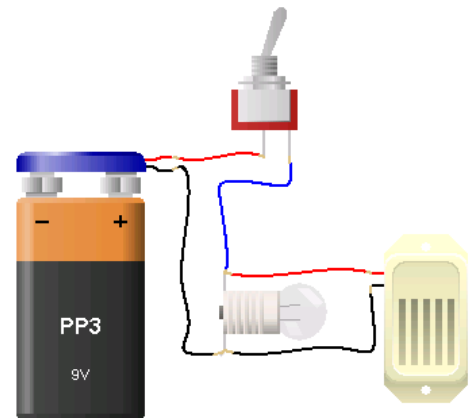


Moneypoint Power station

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

Circuit diagram

Correct symbols 2 mks.
Correct circuit 2 mks.



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

Name **2 mks.**

Precaution **2 mks.**



- (o) Product design is a very important part of the manufacturing industry.
When designing this toaster list **two** things that the designer had to take into consideration.

1 **2 mks.**

2 **2 mks.**

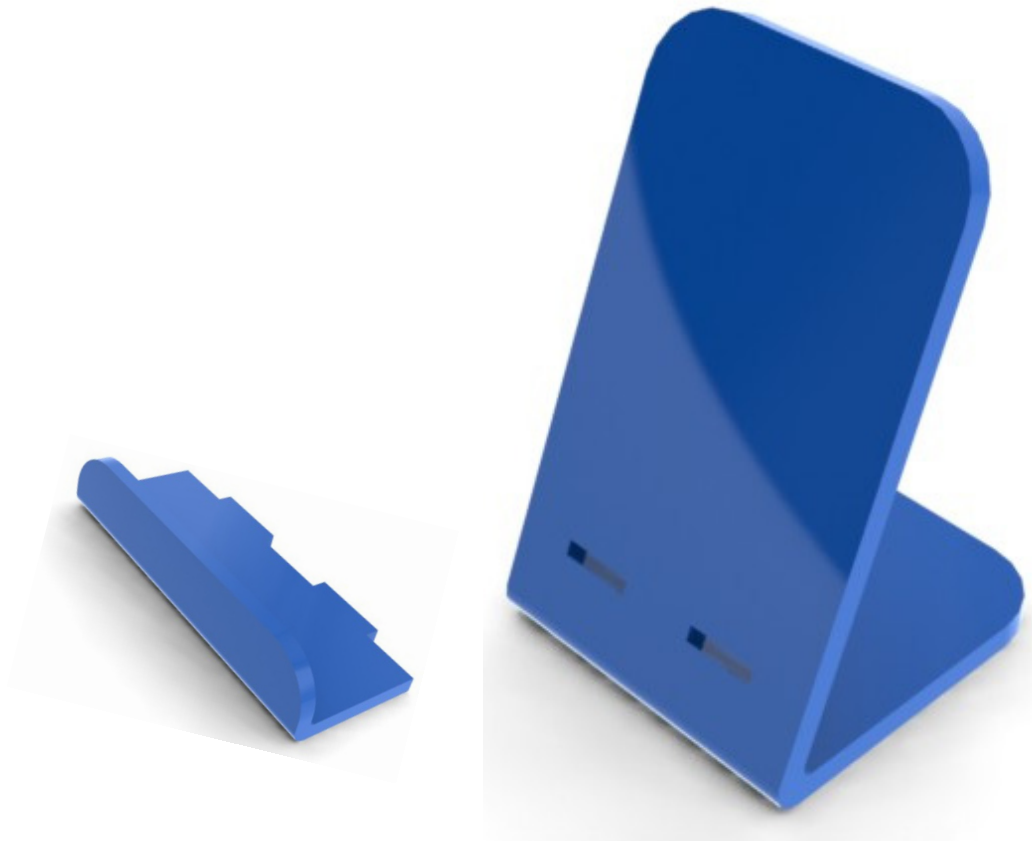


Electric toaster

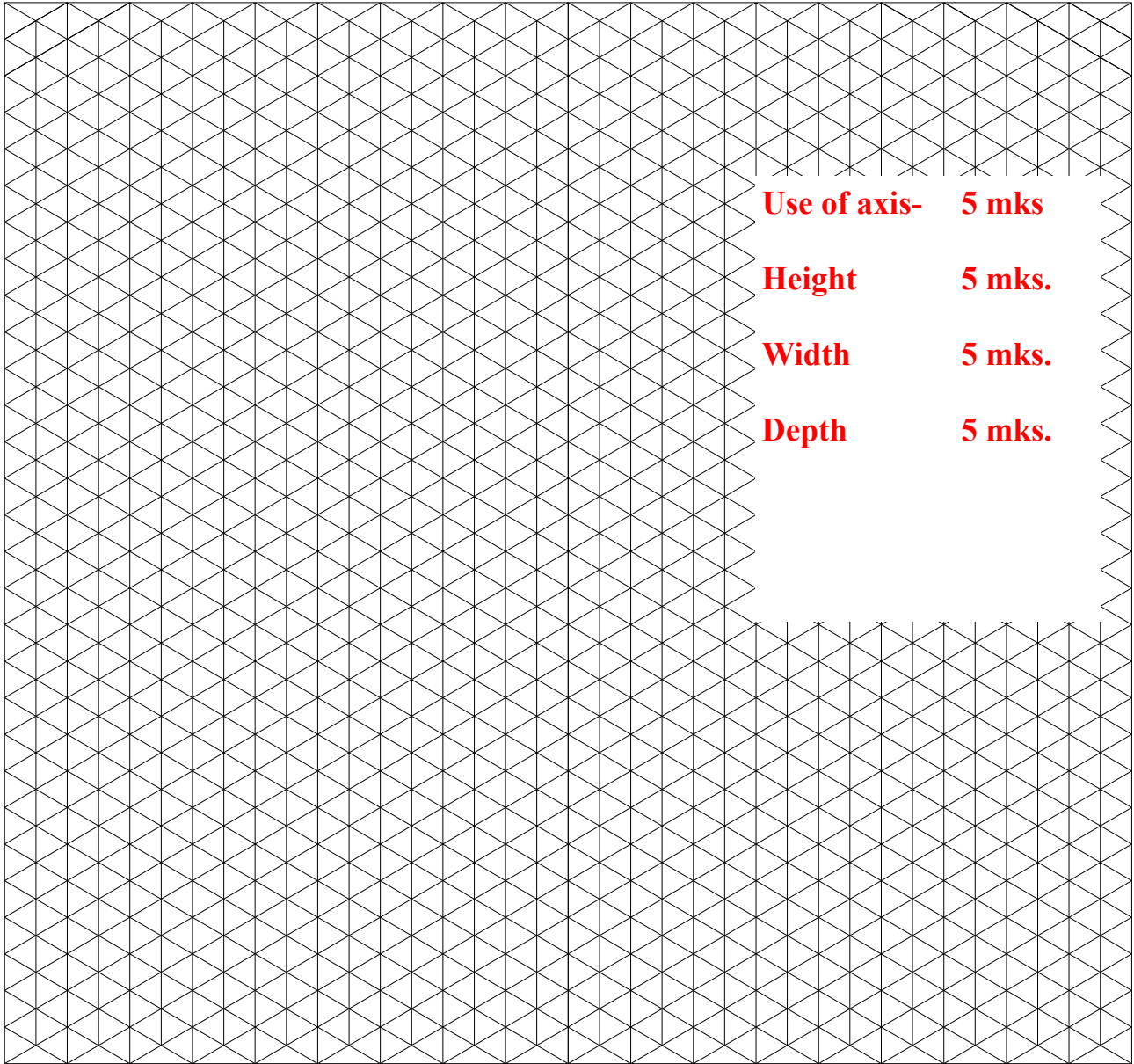
Compulsory

2. Graphical Communication

- (a) The 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



Use of axis- 5 mks

Height 5 mks.

Width 5 mks.

Depth 5 mks.

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

Back 0 — 5 mks.

Shelf 0 — 5 mks.

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 **1 mks.**

2 **1 mks.**



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

1 **1 mks.**

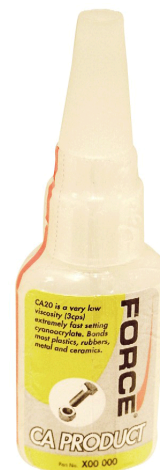
2 **1 mks.**



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

1 **1 mks.**

2 **1 mks.**



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

Sign A



Sign A

1

2x2 mks. each

2



Sign B

1

2x2 mks. each

2

Sign B

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

1

2x1 mk. each

2



Angle Grinder

1

2x1 mk. each

2



Strip Heater

1

2x1 mk. each

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

Sketch 0 — 12 mks.



Miniature DC motor

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

- (i) Explain the term MDF.

Answer **4 mks.**

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

6 mks.

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

Answer **2 mks.**



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

Answer **2x2 mks.**



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

| |
|--------------------|
| Wood to Wood |
| Acrylic to Acrylic |
| Acrylic to Metal |

**3x2 mks.
each**

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

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

Name **2 mks.**

Use **2 mks.**



Name **2 mks.**

Use **2 mks.**



Name **2 mks.**

Use **2 mks.**



Name **2 mks.**

Use **2 mks.**



2. Design and Manufacture

(50 marks)

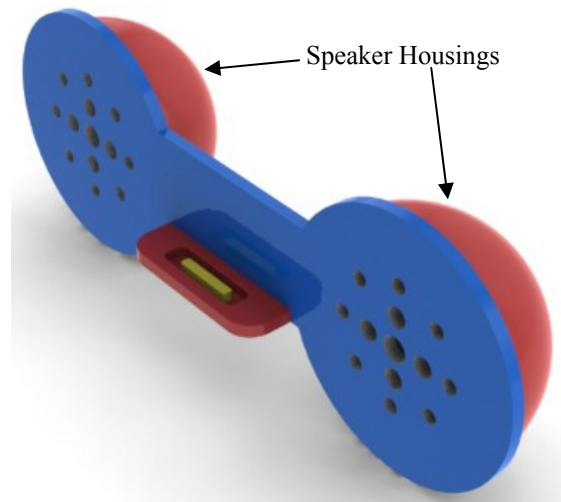
(a) An MP3 player docking station is shown opposite.

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

Plastic **2 mks.**

Reason 1 **2 mks.**

Reason 2 **2 mks.**



MP3 Player Docking Station

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

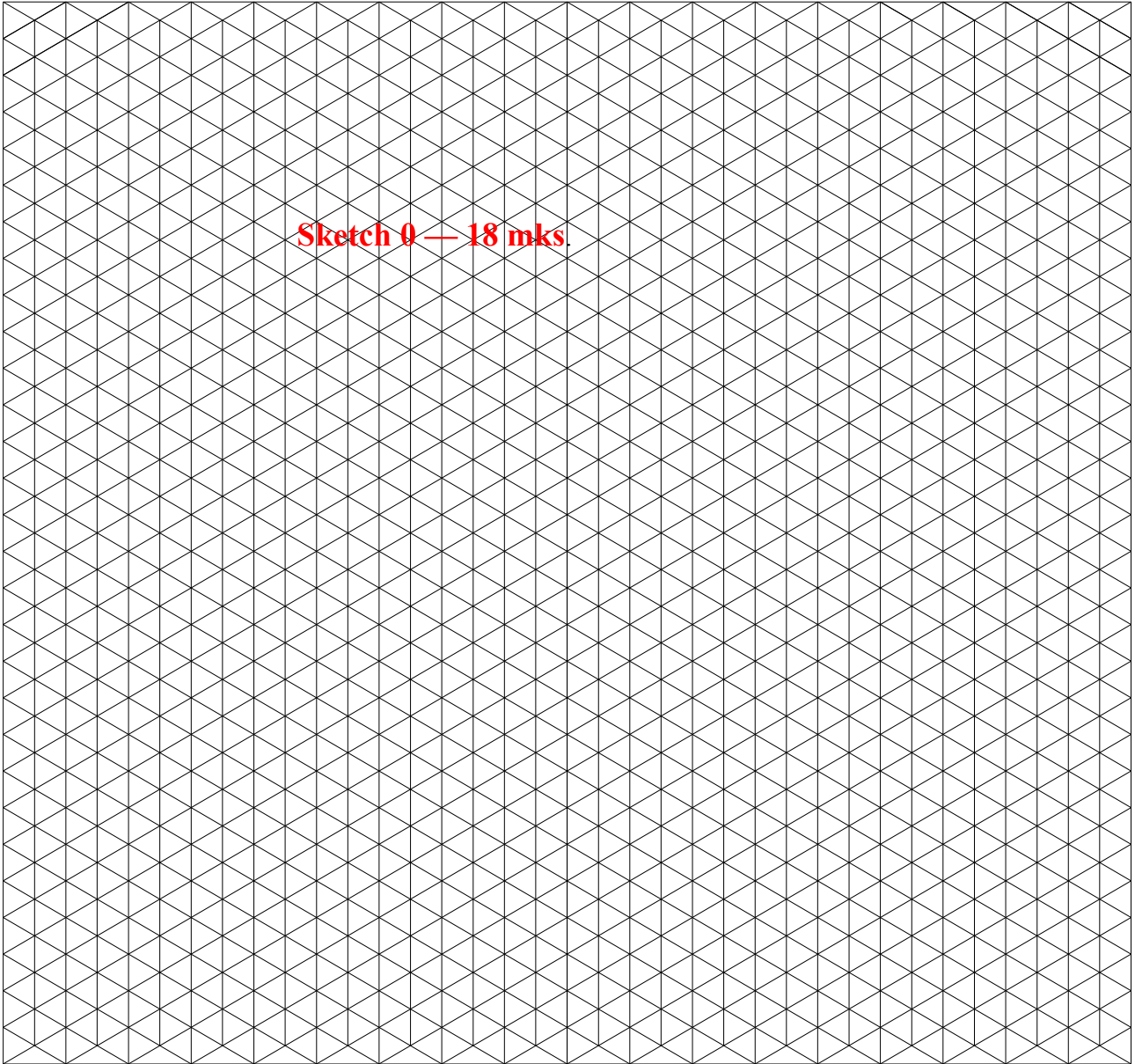
Explanation **2 points x 3 mks. each**
3 rd point - 2 mks.

Sketch 0 — 10 mks.

- (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

2 mks.



Sketch 0 — 18 mks.

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

1

3 mks.

2

3 mks.

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 **5 mks.**



Fitting 2 **5 mks.**



Fitting 3 **5 mks.**



(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 **Mention of correct glue — 4 mks**
Application — 3 mks.
Fitting — 3 mks.



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 **4 mks.**

Reason 2 **4 mks.**



(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 **3 mks.**



Water pump

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

1 **3 mks.**

2 **3 mks.**

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

0 —8 mks.

4. Electrical Understanding and Electronics

(50 marks)

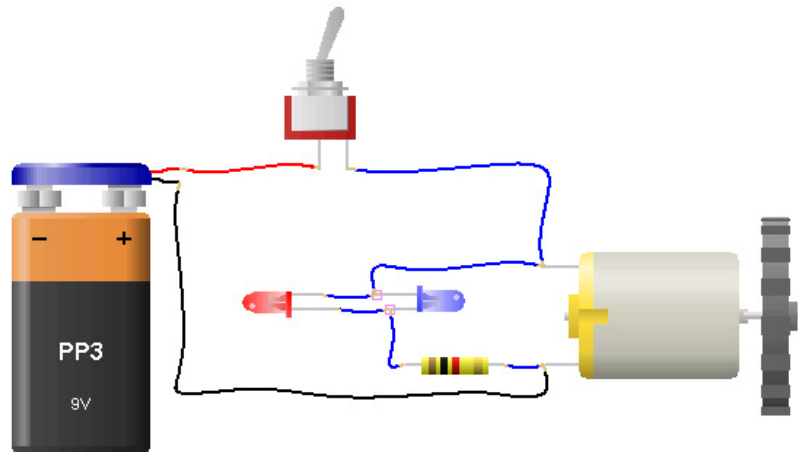
(a) In the spaces below make a sketch of **each** of the electronic components listed..

| | | | | | |
|-----------|------------------------|-----|--------------|-----------|------------|
| Component | 5 x 2 mks. each | | | | |
| 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: **LED — 2 mks.**



Explanation —5 mks.

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

Circuit diagram

5 components x 2 mks each

- (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?



Function **3 mks.**

Why copper? **3 mks.**

Earth Rod

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

Formula — 3 mks.
Answer — 2 mks.



- (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).

Formula — 3 mks.
Answer — 2 mks.



- (iv) Micro-generation refers to the means by which ordinary 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 **4 mks.**

Method 2 **3 mks.**

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 | 4 x 3 mks. each | 4 x 3 mks. each |
| 2 | | |
| 3 | | |
| 4 | | |

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

1 **2 x 3 mks. each**
1 x 2 mks.

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 |
|------------------------|------------------|-------------|-------------|-----------------|
| 4 x 2 mks. each | | | | |

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

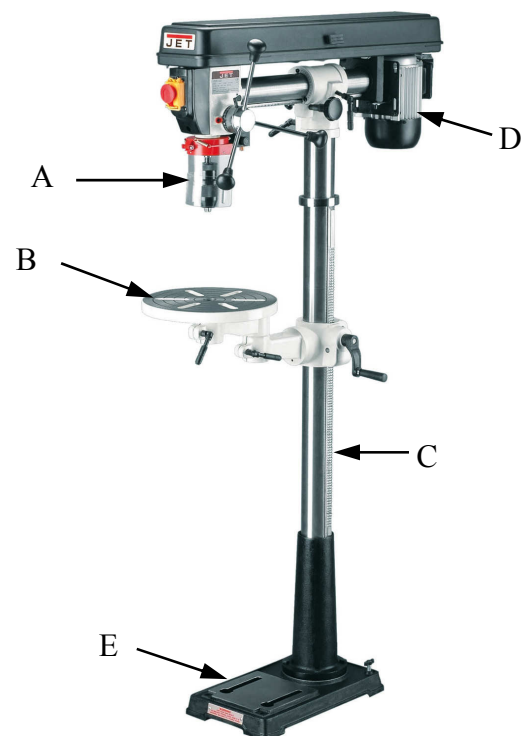
A **5 x 2 mks. each**

B _____

C _____

D _____

E _____



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