



Coimisiún na Scrúduithe Stáit State Examinations Commission

S36

JUNIOR CERTIFICATE EXAMINATION, 2005

SCIENCE - ORDINARY LEVEL

[N.B. Not for Science – Local Studies Candidates]

THURSDAY, 16 JUNE – MORNING, 9.30 to 12.00

INSTRUCTIONS

1. Write your **examination number** in the box provided on this page.
2. Answer **SECTION A**.
3. Answer **ANY THREE SECTIONS** from **SECTIONS B, C, D, E**.
4. Answer **all questions** in the spaces provided. If you require extra space, there are pages provided at the back of this booklet.

Centre Number

Examination Number

For examiner use only

1. Total of end of page totals	
2. Aggregate total of all disallowed question(s)	
3. Total marks awarded (1 minus 2)	

For examiner use only

QUESTION MARK

Section A	Q.1	
Section B	Q.2	
	Q.3	
	Q.4	
Section C	Q.5	
	Q.6	
	Q.7	
Section D	Q.8	
	Q.9	
	Q.10	
Section E	Q.11	
	Q.12	
	Q.13	
	Q.14	
	Q.15	
	Q.16	

TOTAL

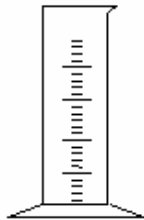
GRADE

SECTION A – CORE (144 MARKS)

Answer any 12 parts (a), (b), (c), etc. from this Section.

Question 1

(a) **Name** and give **one use** for the following pieces of equipment.



NAME _____

USE _____

(b) In each case choose the correct **unit** from the list on the right, for the measurement of each physical quantity stated below.

QUANTITY	UNIT
Volume	
Area	
Mass	
Length	

- kg
- cm
- cm²
- cm³

(c) **Energy** has many different forms. **Complete** the statements below.

Energy cannot be created or destroyed. It can be _____ from **one form to another**.

Energy is **the ability to do** _____.

Energy **released from the nucleus** of an atom is called _____ energy.

The energy **stored in a battery** is called _____ energy.

(d) In each case choose the correct **piece of equipment** from the list on the right to match the uses given below.

To measure the length of a **cross country race** _____

To measure **electric current** _____

To measure the **weight** of an object _____

To measure the length of a **curved line** _____

SPRING BALANCE

AMMETER

TRUNDLE WHEEL

OPISOMETER

(e) The ESB meter readings shown below record the number of units of electricity used in a home. Based on the readings in the table below, find how many **units** were used this period.

Previous Reading (kWh)	Present Reading (kWh)	Number of units used this period
18570	19820	

If each unit costs 10 cent, find the **cost** of the electricity used. _____

The unit used by the ESB for costing is the **kWh**. What do the letters **kWh** stand for?

Give **one** example of an electrical **appliance** in the home which has a **high power rating** (greater than 1 kW). _____

(f) Fill in the table below identifying each of the changes listed as a **chemical change** or as a **physical change**.

Melting of ice

Boiling an egg

Burning of wood

Tearing of paper

CHEMICAL CHANGE	PHYSICAL CHANGE

(g) Metals have certain characteristics such as lustre, malleability, ductility and the ability to form alloys. In each case choose a **word** from the list on the right to match the statement below.

Metals are **shiny**. _____

Metals can be **beaten** (hammered) into shape. _____

Metals can be **stretched into wires**. _____

The name given to a **mixture** of metals. _____

ALLOYS

DUCTILITY

LUSTRE

MALLEABILITY

(h) The diagram shows a beaker containing **copper sulphate** and **water**. In each case choose a **word** from the list on the right to complete the following sentences.



Water is the _____ in the beaker.

When the copper sulphate _____ in the water a **solution** is formed.

If **more water** is added, the solution becomes more _____.

If **more copper sulphate** is added, the solution becomes more _____.

- | |
|---------------------|
| DISSOLVES |
| CONCENTRATED |
| DILUTE |
| SOLVENT |

(i) **Fossil fuels** are used as a source of energy.

Name one fossil fuel. _____

Fossil fuels were **formed** from _____.

Name a **gas produced** when a fossil fuel is burned in air. _____

State whether fossil fuels are **renewable** or **non-renewable**. _____

(j) Complete the following table using a **word** from the list on the right in each case.

One example has been completed.

Water	Compound
Air	
Nitrogen	
Carbon Dioxide	

- | |
|-----------------|
| ELEMENT |
| COMPOUND |
| MIXTURE |

Give **one** example of an element, not listed above, that is found in air. _____

(k) Animals and plants exhibit the **characteristics of living organisms**.

There are seven characteristics of living things. State **two** of them.

1 _____ 2 _____

Name **one animal** that can carry diseases harmful to humans. _____

Plants are a source of beneficial drugs in medicine. Give **one example**.

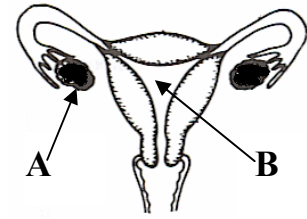
(l) The diagram shows the human **female reproductive system**.

Name part A. _____

Name part B. _____

Mark with the letter **X** where fertilisation usually takes place.

Name **one** substance produced by A. _____



(m) The energy stored by plants can be consumed by animals. Choose a **word** from the list on the right to complete the first three statements below.

All the energy obtained by _____

comes from _____ and ultimately

from the _____.

Give **one** example of how plants depend on animals in a habitat.

PLANTS

ANIMALS

SUN

(n) In each case choose a **word** from the list on the right to complete the sentences below.

The **process** by which green plants make food is called

_____.

The **gas** released when plants make food is called

_____.

The **chemical** which gives leaves a green colour is

_____.

Carbon dioxide and _____ are converted into **food** by green plants.

WATER

CHLOROPHYLL

PHOTOSYNTHESIS

OXYGEN

(o) **Bacteria, fungi** and **viruses** are micro-organisms which can be useful or harmful.

Give **one use** for bacteria. _____

Give **one use** for fungi. _____

Give **one harmful effect** of bacteria. _____

Name a **disease** caused by a virus. _____

SECTION B – PHYSICS (72 MARKS)

There are **THREE** questions in this Section. Answer any **TWO** of these questions.

Question 2

(a) A cyclist travels 100 metres in 20 seconds.

What is the unit of **distance**? _____ (3)

What is the unit of **time**? _____ (3)

What is the unit of **speed**? _____ (3)

What is the **average speed** of the cyclist? _____ (3)

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

(b) **Diagram A**, shows a **ray of light** hitting a surface and bouncing back.

What **word** describes the bouncing back of the ray of light?
 _____ (3)

The equipment shown in **diagram B**, is used in an experiment.

What would the person see when the three cards are set up **as shown**? _____ (3)

What would the person see if the **middle card** were moved slightly? _____ (3)

What does this experiment tell us about **light**?
 _____ (3)

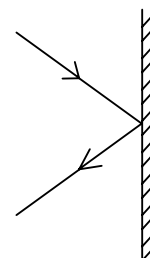


Diagram A

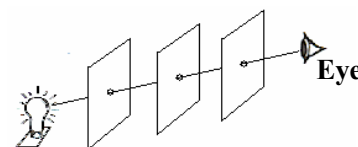


Diagram B

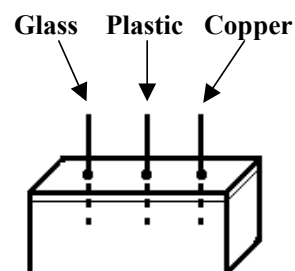
(c) Heat travels by **conduction**, **convection** and **radiation**. A student is supplied with a metal container filled with boiling water and three rods; one **plastic**, one **glass** and one **copper** as shown in the diagram. There is wax at the top of each rod.

By which **method** does heat travel along the rods?
 _____ (3)

Why should all the rods be the **same length** and the **same thickness**?
 _____ (3)

On which rod will the **wax melt** first?
 _____ (3)

What does this experiment tell us about this **material**?
 _____ (3)



Question 3

- (a) **Friction** is an example of a force. It acts in many ways. The diagram shows a car. When a car is driven, friction can be both **useful** and **not useful**.

Give **two** examples of when friction is **useful** when a car is driven.

- 1 _____ (3)
 2 _____ (3)



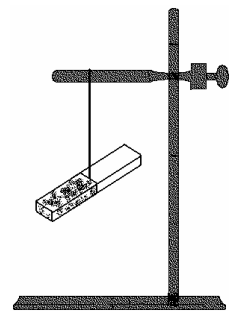
Give **two** examples of when friction is **not useful** when a car is driven.

- 1 _____ (3)
 2 _____ (3)

- (b) A **bar magnet** was hung freely as shown in the diagram.

What happens if the **North** pole of another magnet is brought close to the **North** pole of the hanging magnet? _____ (3)

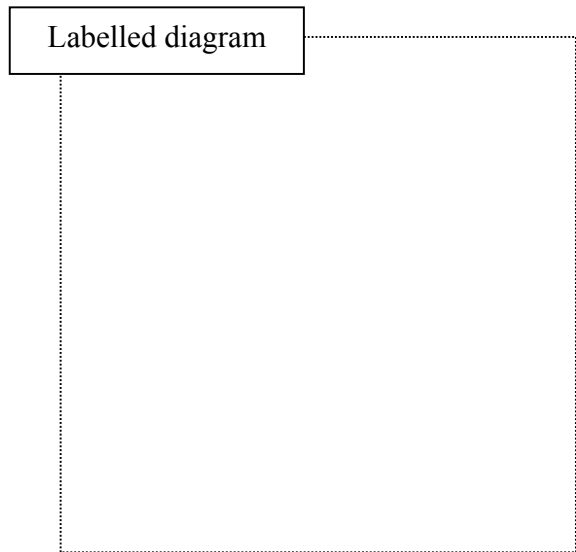
What happens if a **North** pole is brought close to the **South** pole of the hanging magnet? _____ (3)



Draw the **pattern** made if iron filings are scattered around the bar magnet. (6)



- (c) Describe, with the aid of a labelled diagram, an experiment to **show that the atmosphere exerts pressure**. (12)



Question 4

(a) In each case choose a **word** from the list on the right to complete the sentences below.

Temperature is a measure of _____.

(3) **TOG VALUE**

The upwards **movement of air** is caused by _____.

(3) **INSULATOR**

The **insulating** quality of a duvet is shown by its

CONVECTION

_____.

(3) **HOTNESS**

Aeroboard is an example of a good _____.

(3)

(b) The diagram shows the inside of a **three-pin plug**.

What **colour** is the live wire labelled **A**? _____ (3)

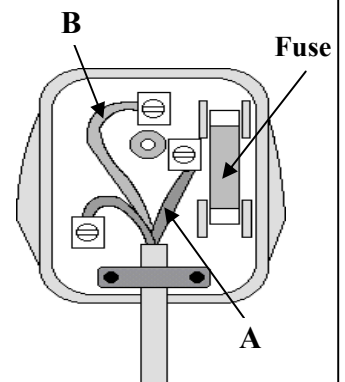
What **colour** is the earth wire labelled **B**? _____ (3)

What is the purpose of the **fuse**?

_____ (3)

Give **one** reason why it is dangerous to handle a plug with wet hands.

_____ (3)



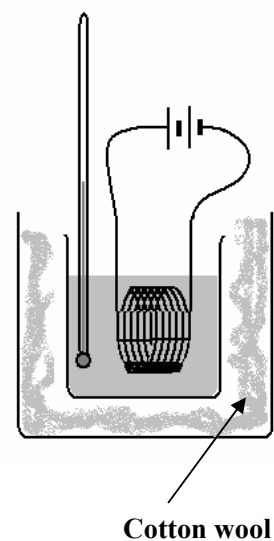
(c) The diagram shows an **electric current passing through a coil of wire** placed in a beaker of water.

What happens to the **water** when a current flows through the coil? _____ (3)

What piece of **apparatus** is needed to measure this change? _____ (3)

Why is the container surrounded with **cotton wool**? _____ (3)

Name **one** household appliance that uses this effect of electricity. _____ (3)



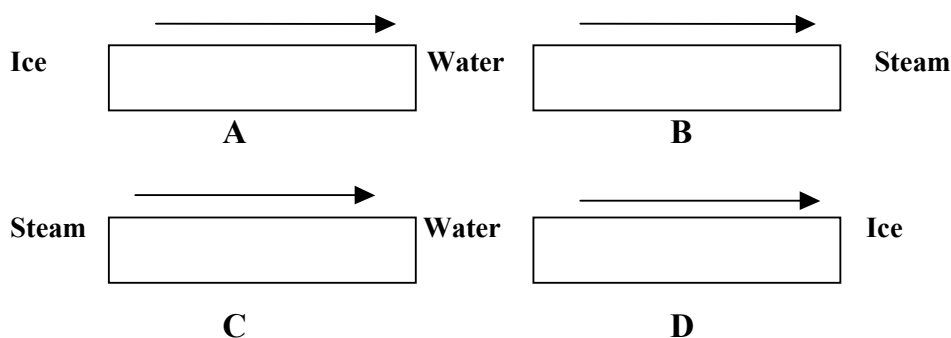
SECTION C – CHEMISTRY (72 MARKS)

There are **THREE** questions in this Section. Answer any **TWO** of these questions.

Question 5

(a) Fill in the spaces **A, B, C** and **D** using the following words. (12)

FREEZING MELTING CONDENSATION BOILING



(b) Water is **treated** in several ways to make it suitable for drinking. In each case match a **treatment** from the list on the right with a statement below.

Removes of large **floating debris** _____ (3)

Helps **prevent** tooth decay _____ (3)

Kills **bacteria** and **germs** _____ (3)

Allows **large particles** to sink to the bottom of a tank _____ (3)

- | |
|---------------------|
| CHLORINATION |
| SETTLING |
| FLUORIDATION |
| SCREENING |

(c) There are two types of water hardness, **temporary** and **permanent**.

How is temporary hardness **removed** from water? _____ (3)

Give one **advantage** of hard water. _____ (3)

Give one **disadvantage** of hard water. _____ (3)

The same volume of two water samples **A** and **B** were tested with soap solution to compare their hardness. The amount of **soap solution** needed to form a lather was measured and recorded in the table below.

Water Sample	Soap Solution (cm ³)
A	6
B	18

Which sample **A** or **B** has the most hardness? _____ (3)

Question 6

(a) In each case choose a **word** from the list on the right to complete the statements below.

The chemical **symbol** for _____ is **S**. (3)

The chemical **symbol** for _____ is **Na**. (3)

The **gas** in air needed for **burning** is _____. (3)

The **gas** released from the reaction of **zinc** with
hydrochloric acid is _____. (3)

HYDROGEN

SODIUM

SULPHUR

OXYGEN

(b) The apparatus shown in the diagram was set up to **prepare and collect carbon dioxide**.

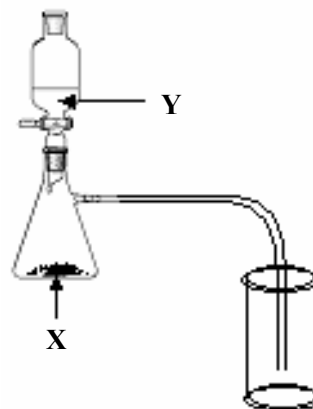
Name the solid **X**. _____ (3)

Name the liquid **Y**. _____ (3)

Carbon dioxide turns _____ **milky**. (3)

State **one use** for carbon dioxide.

_____ (3)



(c) Describe, with the aid of a labelled diagram, an experiment to **separate soil and water**. (12)

Labelled diagram

Question 7

- (a) In each case choose a **word** from the list on the right to complete the sentences below. (Note: one of the words is used twice).

_____ are found **outside** the nucleus of an atom. (3)

Protons are found in the _____ of an atom. (3)

These particles of an atom have **no charge**. _____ (3)

These particles are gained or lost when atoms become **ions**. _____ (3)

ELECTRONS

NEUTRONS

NUCLEUS

- (b) **Litmus indicator** is used to test for acids and bases.

What is the colour of litmus in an **acid**? _____ (3)

What is the colour of litmus in a **base**? _____ (3)

The table below shows the **pH** of four solutions including vinegar and an oven cleaner.

Solution 1	Solution 2	Solution 3	Solution 4
pH = 1	pH = 4	pH = 8	pH = 14

Which solution is **vinegar**? _____ (3)

Which solution is **oven cleaner**? _____ (3)

- (c) The diagram shows an **experiment** that can be carried out in the laboratory.

Name the **process** being investigated in the experiment.

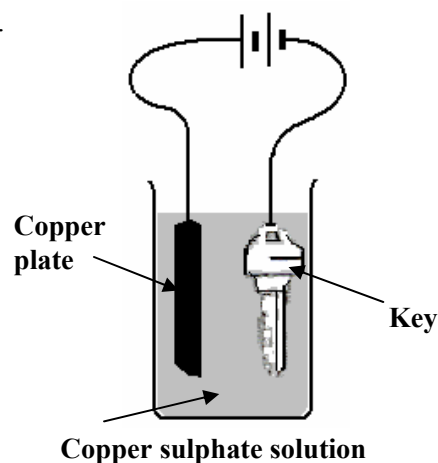
_____ (3)

What happens to the **copper electrode**?

_____ (3)

What happens to the **key**?

_____ (6)



SECTION D – BIOLOGY (72 MARKS)

There are THREE questions in this Section. Answer any TWO of these questions.

Question 8

(a) The diagram shows a set of human **teeth**.

Name the type of teeth labelled **A**. _____ (3)

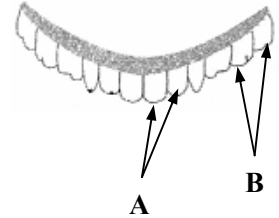
Name the type of teeth labelled **B**. _____ (3)

Give **one function** of teeth **A**.

_____ (3)

Give **one function** of teeth **B**.

_____ (3)



(b) The diagram shows the **human digestive system**.

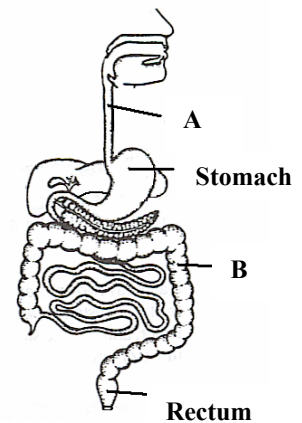
Name part **A**. _____ (3)

Name part **B**. _____ (3)

What is the main **function** of **B**?

_____ (3)

Name one type of **chemical** that helps break down food in the digestive system. _____ (3)



(c) The diagram shows the human **respiratory (breathing) system**.

Name the parts labelled **A**, **B** and **C**.

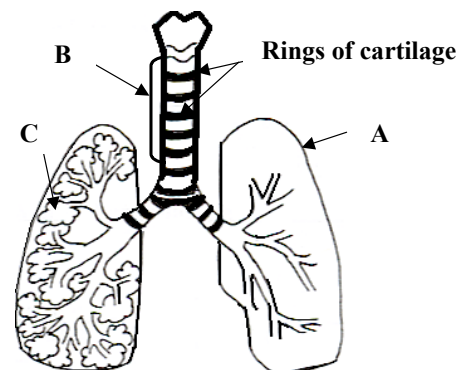
A _____ (3)

B _____ (3)

C _____ (3)

What do the **rings of cartilage** do?

_____ (3)



Question 9

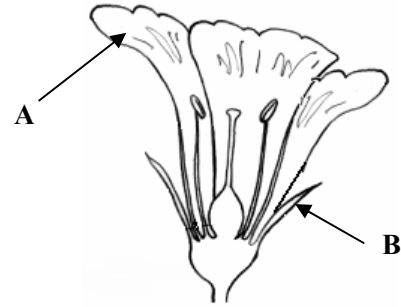
(a) The diagram shows the structure of a **flower**.

Name part **A**. _____ (3)

Name part **B**. _____ (3)

What is produced by the **stamen**?
 _____ (3)

What is produced by the **carpel**?
 _____ (3)



(b) A **soil sample** was placed in water in a container, shaken and allowed to stand as shown in the diagram.

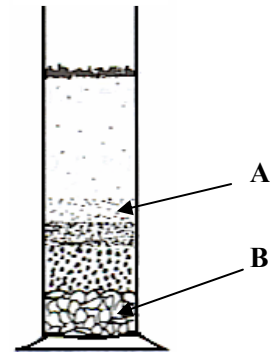
Name the soil particles found at **A** and **B**.

A _____ (3)

B _____ (3)

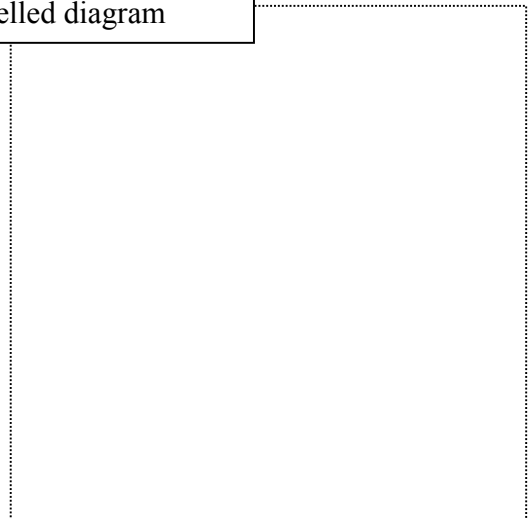
Name the soil particles still **suspended** in the water.
 _____ (3)

Name the substance **floating** on the surface of the water.
 _____ (3)



(c) Describe, with the aid of a labelled diagram, an experiment to show **that seeds need moisture to germinate**. (12)

Labelled diagram



Question 10

(a) The diagram shows a **flowering plant**.

Give **two** functions of the **root** of a plant.

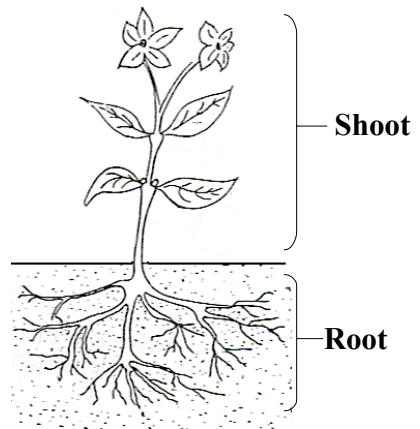
1 _____ (3)

2 _____ (3)

Give **two** functions of the **shoot** of a plant.

1 _____ (3)

2 _____ (3)



(b) The diagram shows two pieces of equipment, **A** and **B**, which are used in the study of a habitat.

Name the piece of equipment labelled **A**.

_____ (3)

Give one **use** for **A**.

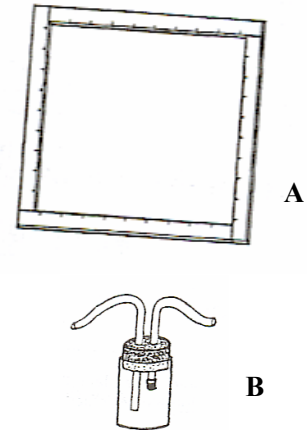
_____ (3)

Name the piece of equipment labelled **B**.

_____ (3)

Give one **use** for **B**.

_____ (3)



(c) The diagrams show an **animal cell** and a **plant cell**.

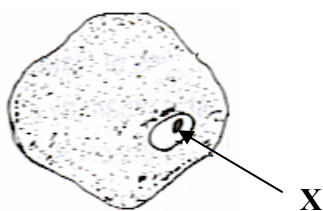


Diagram A

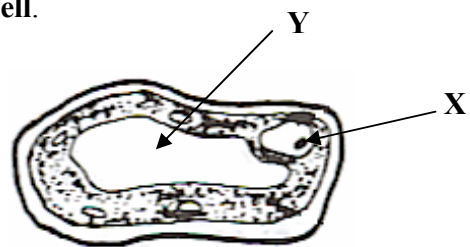


Diagram B

State which diagram, **A** or **B**, shows a plant cell.

_____ (3)

State which diagram, **A** or **B**, shows an animal cell.

_____ (3)

Name the part of the cells above labelled **X**.

_____ (3)

Name the part of the cell above labelled **Y**.

_____ (3)

SECTION E – APPLIED SCIENCE (72 MARKS)

There are SIX questions in this Section. Answer any TWO of these questions.

Question 11 - Earth Science

(a) In each case choose a **number of days** from the list on the right to complete the sentences below.

The time taken for the **earth** to orbit the **sun** is _____ (3)

The time taken for the **moon** to orbit the **earth** is _____ (3)

The number of days in a **leap** year is _____ (3)

The time taken for the earth to **rotate** on its **own axis** is _____ (3)

- 1 day**
- 28 days**
- 365¼ days**
- 366 days**

(b) Various instruments are used in **weather recording** stations.

Name the instrument shown in the diagram. _____ (3)

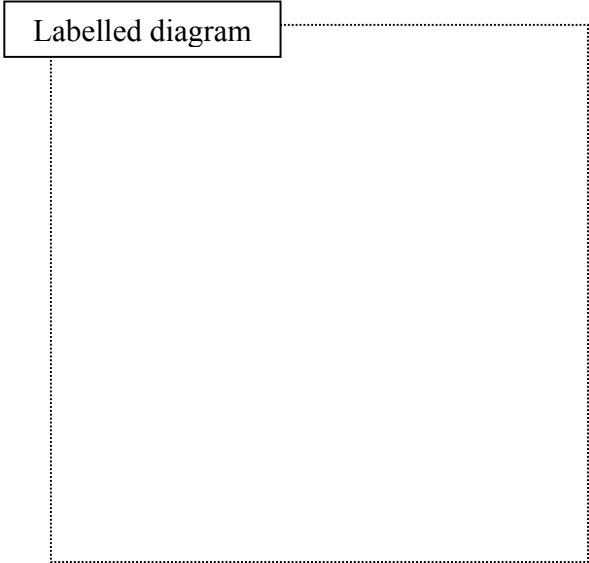
Give **one use** for this instrument. _____ (3)



Name the instrument used to measure **atmospheric pressure**. _____ (3)

Name the instrument used to measure **rainfall**. _____ (3)

(c) Describe, with the aid of a labelled diagram, an experiment to show **the effect of wind on the rate of evaporation of water**. (12)



Question 12 - Horticulture

(a) **Gardeners** grow plants in compost or in soil.

What is a **compost**? _____ (3)

Give **one advantage** of using a compost?

_____ (3)

Give two activities of **earthworms** which increase the fertility of soils.

1 _____ 2 _____ (6)

(b) Name a **plant** from which we get **cut flowers**. _____ (3)

What is the **best time of the day** to harvest cut flowers?

_____ (3)

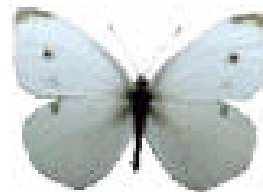
Give **two** ways to keep cut flowers fresh.

1 _____ (3)

2 _____ (3)



(c) **Name either** of the two pests shown in the diagrams below.



Name _____ **or** **Name** _____ (3)

Name the **garden plant** on which the pest you have named feeds. _____ (3)

Name any **two stages of the lifecycle** of the pest you have named.

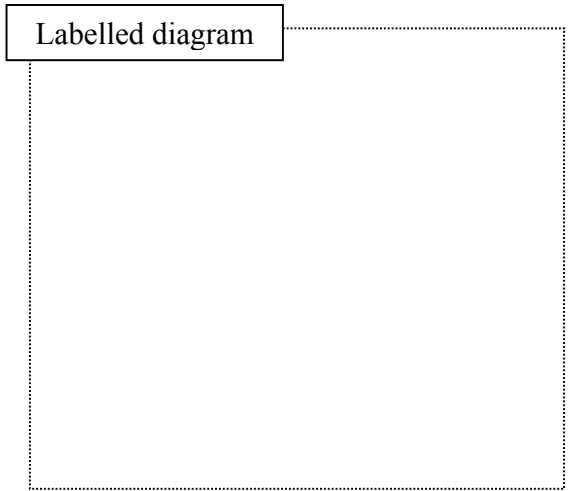
1 _____ (3)

2 _____ (3)

A - PLASTICS

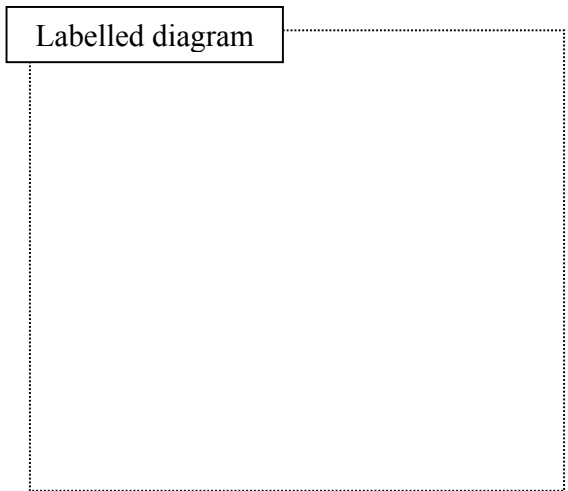
Polythene is an example of a common plastic.

- (i) What is polythene **made** from? _____ (3)
- (ii) Give **one use** for polythene in the home. _____ (3)
- (iii) Describe, with the aid of a labelled diagram, an experiment to **compare the flexibility of two plastics**. (12)



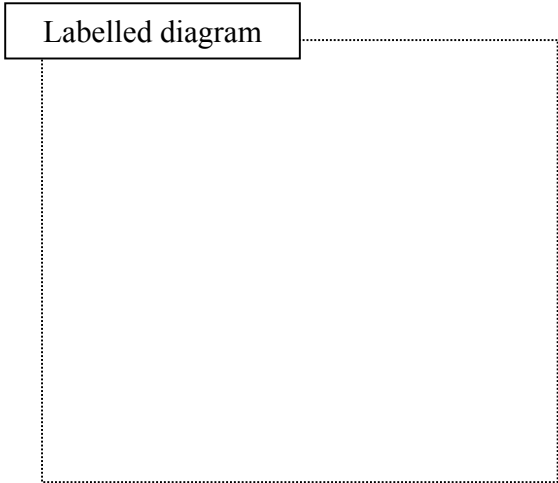
B - TEXTILES

- (i) Name **two natural fibres** used to make textiles.
1 _____ 2 _____ (6)
- (ii) Describe, with the aid of a labelled diagram, an experiment to **compare the absorbency of two different textiles**. (12)



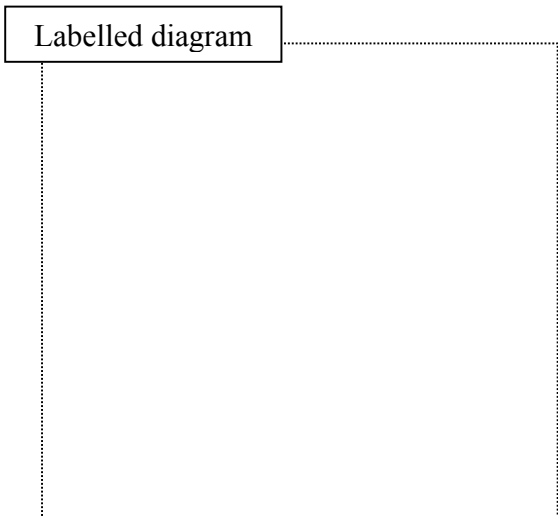
C - METALS

- (i) Name **one** metal that is **mined in Ireland**. _____ (3)
- (ii) Give **one use** for the metal you have named. _____ (3)
- (iii) Describe, with the aid of a labelled diagram, an experiment to **compare the hardness of two metals**. (12)



D - TIMBER

- (i) Name a **hardwood** tree grown in Ireland. _____ (3)
- (ii) Name a **softwood** tree grown in Ireland. _____ (3)
- (iii) Describe, with the aid of a labelled diagram, an experiment to **compare the bending strength of two different timbers**. (12)



Question 14 - Food

(a) In each case choose a **food** from the list on the right that is preserved by each method below.

Salting _____ (3)

Pasteurisation _____ (3)

Freezing _____ (3)

Dehydration (drying) _____ (3)

- COFFEE**
- VEGETABLES**
- MEAT**
- MILK**

(b) **Starch** is an example of a carbohydrate.

Name **one food** which is a **good source of starch**. _____ (3)

Name the **chemical** used to test for the **presence of starch**.

_____ (3)

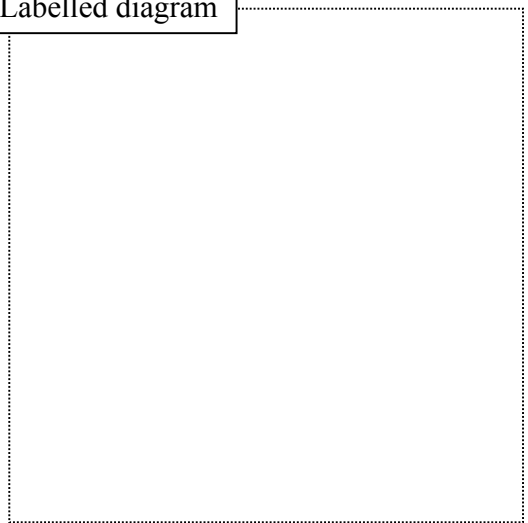
Give **one use** for carbohydrates in the body. _____ (3)

Name one other food **type** that should be part of a balanced diet.

_____ (3)

(c) Describe, with the aid of a labelled diagram, a laboratory experiment to **make butter**. (12)

Labelled diagram



Question 15 - Electronics

(a) Study the **circuit diagram** shown.

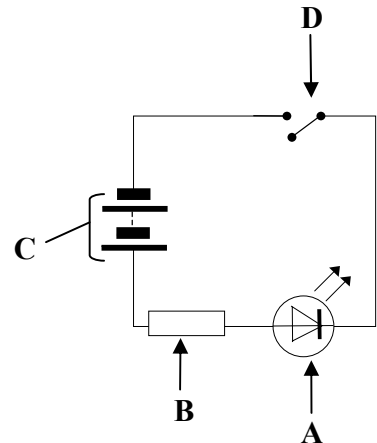
Name the device labelled **A**. _____ (3)

Name the device labelled **B**. _____ (3)

What will be observed if the **switch D** is closed?

_____ (3)

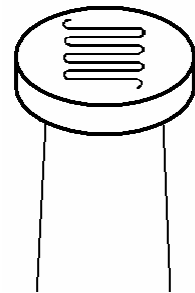
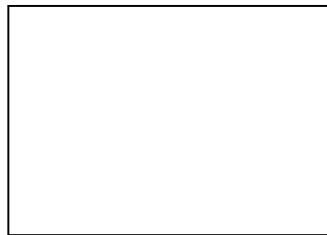
What is **C** called? _____ (3)



(b) The diagram shows an **LDR**.

An **LDR** is a light _____ resistor. (3)

Draw the **circuit symbol** for an LDR. (3)



Give **one everyday use** of an LDR. _____ (3)

The **resistance** of an LDR **increases** in _____ light. (3)

(c) Draw a circuit diagram to show **how the brightness of a bulb can be controlled by a variable resistor**. (12)

Circuit diagram

Question 16 - Energy Conversions

(a) Choose an **energy conversion** from the list on the right to describe the energy conversion taking place when

you **rub** your hands together _____ (3)

you **pluck** a guitar string _____ (3)

a candle is **burning** _____ (3)

an apple is **falling**. _____ (3)

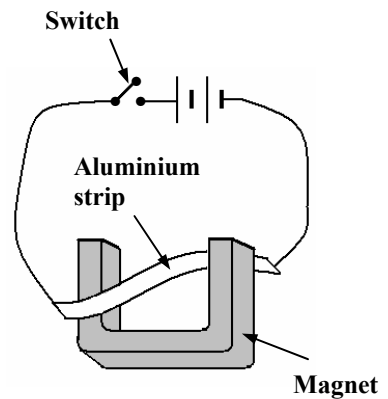
- | |
|---|
| <p>CHEMICAL TO LIGHT</p> <p>KINETIC TO HEAT</p> <p>KINETIC TO SOUND</p> <p>POTENTIAL TO KINETIC</p> |
|---|

(b) The diagram shows an experiment set up to show the **effect of a magnetic field on a current-carrying conductor**.

What happens to the **aluminium strip** when the switch is closed? (3)

What would happen to the aluminium strip if the **current direction was reversed**? (3)

Name a **device** that uses the effect seen in this experiment. _____ (6)



(c) The diagram shows the parts of an **electromagnet**.

Name the **metal** used to make the core. _____ (3)

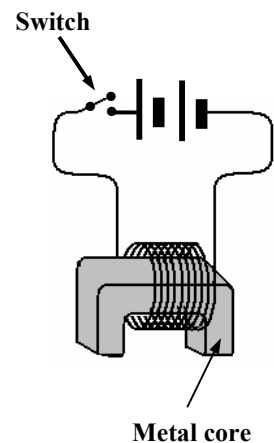
How could you show that an electromagnet is formed when the switch is closed? _____ (3)

_____ (3)

State one **energy change** which takes place in the circuit when the switch is closed. _____ (3)

Give **one everyday use** of an electromagnet. _____ (3)

_____ (3)



EXTRA WORKSPACE

Indicate **clearly** the number of the question(s) you are answering.

Lined area for extra workspace.