



Coimisiún na Scrúduithe Stáit State Examinations Commission

S36

JUNIOR CERTIFICATE EXAMINATION, 2006

SCIENCE - ORDINARY LEVEL

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

THURSDAY, 15 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

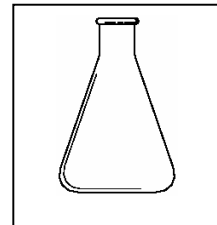
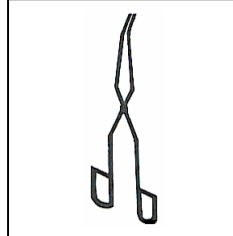
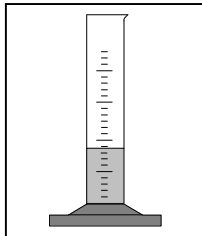
GRADE

SECTION A – CORE (144 MARKS)

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

Question 1

(a) Name the following pieces of equipment.



NAME _____

(b) Complete the following sentences by using one word in each case from the list on the right.

Boilers have **lagging jackets** for heat _____.

The **changing** of a liquid to a vapour is _____.

The Sun **heats** the Earth by _____.

Heat **travels** through liquids by _____.

- CONVECTION
- EVAPORATION
- INSULATION
- RADIATION

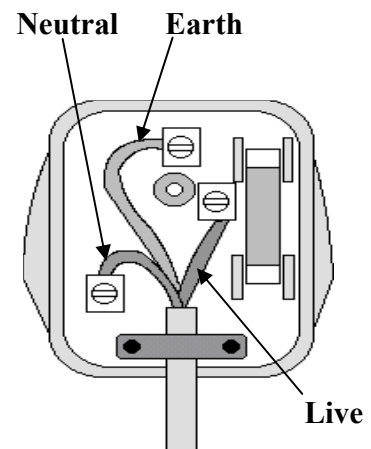
(c) The diagram shows the inside of a **three-pin plug**.

Name a **metal** used to make the wires in the plug.

Name the **material** that is used to insulate the wires.

What **colour** is the covering (insulation) on the **live** wire?

What is the function of a **fuse** in a plug?



- (d) In each case choose the correct **quantity** from the list on the right to match the units given below.

UNIT	QUANTITY
cm ³	
cm ²	
kg	
m	

MASS
VOLUME
LENGTH
AREA

- (e) The **solar system** is made up of the Sun and nine planets.

Name the planet **nearest** to the Sun. _____

Name the planet **furthest** from the Sun. _____

Give **two** reasons why the Earth can support life.

1 _____ 2 _____

- (f) Natural gas is mostly **methane** (CH₄).

Name the two elements found in methane gas.

1 _____ 2 _____

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

Name **one** other fossil fuel. _____

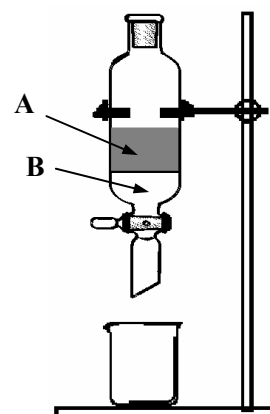
- (g) A **mixture** of oil and water was poured into the piece of equipment shown in the diagram and allowed to settle.

Name this piece of equipment. _____

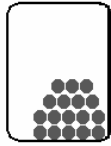
What **liquid** would you find at **A**? _____

How is **liquid B** allowed enter the beaker?

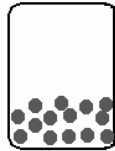
Why is this piece of equipment not suitable to separate alcohol and water?



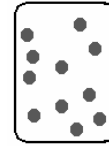
- (h) The diagrams **A**, **B** and **C** show the arrangement of the tiny particles in a solid, liquid and a gas.



A



B



C

Which diagram **A**, **B** or **C**, shows the **liquid**. _____

Name an **energy source** that could be used to change **A** into **B**. _____

Name the **physical change** that takes place when **A** changes to **B**. _____

Name the **physical change** that takes place when **C** changes to **B**. _____

- (i) Acids and bases are present in a variety of common substances. Complete the table below using one word in each case from the list on the right. One example has been completed.

Substance	Acidic/Basic/Neutral
WASHING SODA	BASIC
TOOTHPASTE	
VINEGAR	
OVEN CLEANER	
DISTILLED WATER	

ACIDIC
BASIC
NEUTRAL

- (j) The diagram shows the apparatus to prepare and collect **carbon dioxide** gas in the laboratory. A solid **A** reacts with a liquid **B**.

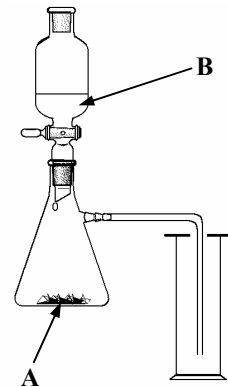
Name the solid labelled **A**. _____

Name the liquid **B**. _____

Give **one** everyday use of carbon dioxide gas.

What **liquid** turns milky white if carbon dioxide is bubbled

through it? _____



- (k) Living things can be divided into animals and plants. In each case **choose** an animal or a plant from the list on the right to complete the sentences below.

The _____ can **spread disease** to humans.

The _____ can **cause damage** to roses.

The _____ can be used in **medicine**.

The _____ can be used to make **flour** for bread making.

GREENFLY
FOXGLOVE
WHEAT
MOSQUITO

(l) The amount of **energy** contained in two different meals is shown in the table below.

Meal A	Energy (kJ)
Sausage	340
Chips	2220
Fried egg	840
Tea	40

Meal B	Energy (kJ)
Salad	140
Salmon	730
Brown bread & butter	600
Glass of milk	612

Which meal, **A** or **B** gives the most energy? _____

Give **one use** for energy in our bodies. _____

Which meal **A** or **B** contains the more fibre? _____

What is the main **function** of fibre in the diet? _____

(m) Humans use five senses to pick up information about the outside world. Complete the table below. One column has been completed as an example.

SENSE	Touch	Sight			Taste
SENSE ORGAN	Skin		Ear	Nose	

(n) A green plant is placed in bright light for a number of hours.

Name the part of the plant that makes most **food**.

Name the substance that gives plants their **green colour**.

Name the **process** by which plants make their own food.

Name the **chemical** that is used in the laboratory to test if food has been made by a plant.



(o) Micro-organisms such as **fungi**, **bacteria** and **viruses** can be both useful and harmful.

State one way in which **bacteria are useful** to people. _____

State one way in which **bacteria are harmful** to people. _____

Give one **use of fungi**. _____

Name one **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) Name an **instrument** used to measure **distance**. _____ (3)

Name an **instrument** used to measure **time**. _____ (3)

A runner travels 720 metres in 60 seconds.

What is the **unit** of **speed**?

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

(3)

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

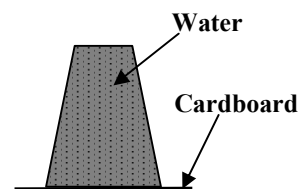
(b) A glass was filled with water and a piece of card placed on top. The glass of water was then carefully turned upside down as shown in the diagram.

Does the **water** pour out of the glass when it is turned upside down?

(3)

What does this **experiment** show?

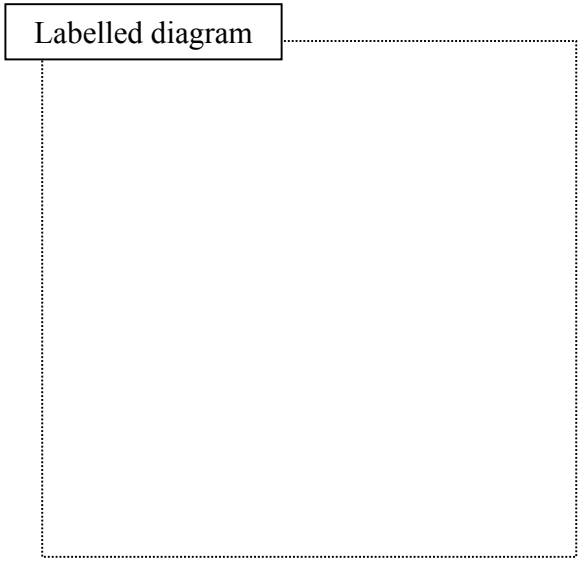
(3)



Friction is a force between two objects moving over each other. Give **two** other examples of forces.

1 _____ 2 _____ (6)

(c) A student is given a smooth table, a block of wood, coarse sandpaper and a spring balance (newton meter). Describe, with the aid of a labelled diagram, how these could be used to **show that sandpaper increases friction**. (12)



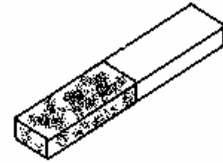
Question 3

(a) The diagram shows a bar magnet. **Complete** the following sentences.

Like poles of magnets _____ each other. (3)

Unlike poles of magnets _____ each other. (3)

_____ is a **metal** which is attracted by a magnet. (3)



Give **one** use of a magnet in the home. _____ (3)

(b) The diagram shows an electric circuit. When the switch is closed an **electric current passes through the coil of wire** placed in a beaker of water.

What happens to the water in the beaker when the switch is **closed**?

_____ (3)

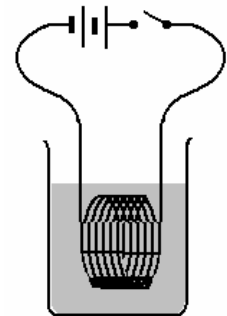
What **energy change** takes place?

_____ (3)

A 2 kW **electric fire** is switched on for four hours.

How many **units** (kWh) does it use? _____ (3)

If each unit costs 10 cent, find the **cost** of the electricity used. _____ (3)



(c) The diagram shows a **flask of air** being heated gently with a hairdryer.

What effect does this heat have on the **volume of air** in the flask?

_____ (3)

How does the student know that the heat is having this effect?

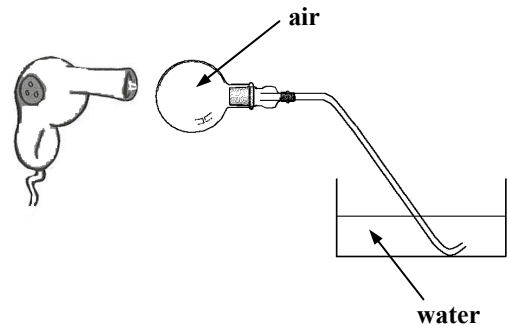
_____ (3)

What happens to the water in the trough as the flask **cools down**?

_____ (3)

What does this experiment tell us about **air when it is cooled**? _____

_____ (3)



Question 4

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

Sound is a form of _____ (3)

An _____ is a **reflected** sound. (3)

Sound needs a _____ to **travel** through. (3)

Sound is **produced** by _____ (3)

- | |
|--|
| <p>VIBRATIONS</p> <p>ENERGY</p> <p>ECHO</p> <p>SUBSTANCE</p> |
|--|

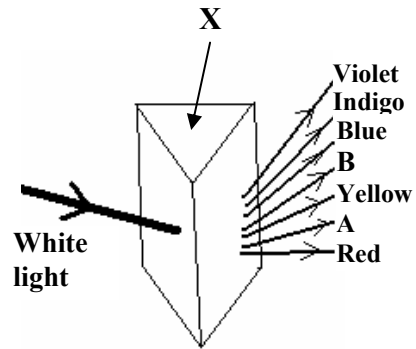
(b) The diagram shows a beam of white light being passed through a piece of equipment X, forming a **band of colours (spectrum)** on a screen.

Name the **process** shown. _____ (3)

Name the piece of equipment X. _____ (3)

Name the **colour A**. _____ (3)

Name the **colour B**. _____ (3)



(c) Describe, with the aid of a labelled diagram, a laboratory experiment to **measure the volume of a small stone**. (12)

Labelled diagram

SECTION C – CHEMISTRY (72 MARKS)

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

Question 5

(a) In each case match a **word** from the list on the right with a statement below.

An **alkali** metal _____ (3)

An example of a **mixture** _____ (3)

The most abundant **gas** in the air _____ (3)

An example of a **compound** _____ (3)

POTASSIUM

WATER

NITROGEN

AIR

(b) The diagram shows an apparatus that may be used to **separate water and a dye**.

Name this separation technique.

_____ (3)

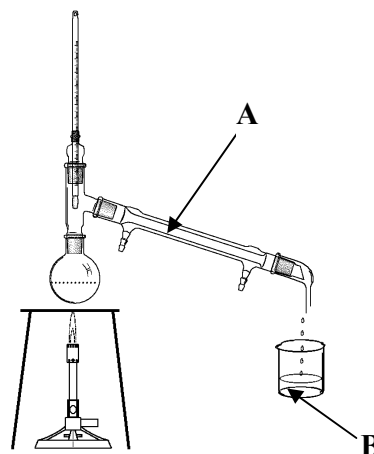
Name the part labelled A.

_____ (3)

At what temperature does **water** boil?

_____ °C (3)

After heating is started liquid collects at B. Is the liquid that collects first mostly **dye** or mostly **water**? _____ (3)



(c) **Hard water** is water which will not easily form a lather with soap. There are **two** types of water hardness.

Name **one** type of **water hardness**. _____ (3)

Give **one advantage** of hard water.

_____ (3)

Give **one disadvantage** of hard water.

_____ (3)

Give **one way to remove the hardness** from water. _____ (3)

Question 6

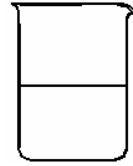
- (a) **Water** and **salt** were added to a beaker. In each case choose a **term** from the list on the right to complete the sentences below.

As the salt _____ in the water a **solution** is formed. (3)

In this solution **water** is the _____. (3)

As the water **evaporates** the solution becomes more _____ (3)

The solution was more _____ at the **beginning**. (3)



- DILUTE**
SOLVENT
CONCENTRATED
DISSOLVES

- (b) **Water** can be used in a **fire extinguisher**.

Why should water not be used on **electrical fires**?

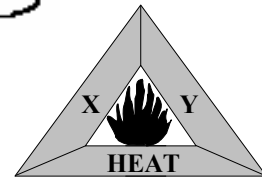
_____ (3)

Name **one** substance other than water that can be used in a fire extinguisher.

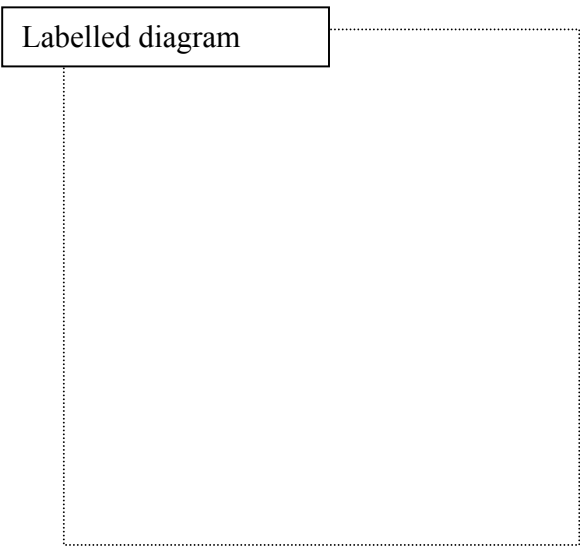
_____ (3)

Name **X** and **Y** in the fire triangle shown that are needed to keep a fire burning.

X _____ **Y** _____ (6)



- (c) Describe, with the aid of a labelled diagram, a laboratory experiment to **show the presence of water vapour in air**. (12)



Question 7

(a) In each case match a **metal** from the list on the right with its **use** given below.

- Used in **yellow street lights** _____ (3)
- Used in **thermometers** _____ (3)
- Used in **jewellery** _____ (3)
- Used in **drink cans** _____ (3)

- | |
|------------------|
| MERCURY |
| GOLD |
| ALUMINIUM |
| SODIUM |

(b) **Rusting** causes damage to iron.

Give **two conditions** necessary for an iron nail to rust.

1 _____ (3)

2 _____ (3)

Give **one** way to stop iron rusting. _____ (3)

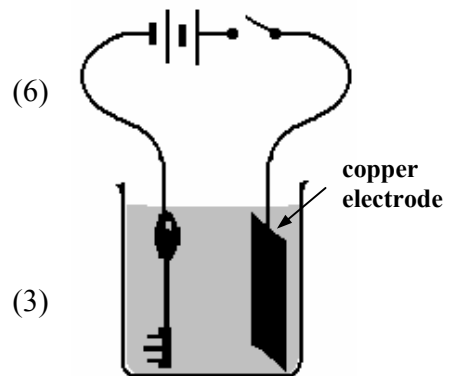
A **mixture** of metals is called an _____. (3)

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

What is **electroplating**? _____

What happens to the **copper electrode** when the switch is closed?

Why are some **metal items** often electroplated?



(6)

(3)

(3)

SECTION D – BIOLOGY (72 MARKS)

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

Question 8

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

Name part A. _____ (3)

Name the **mineral** needed for healthy teeth?
_____ (3)

The build up of **bacteria** and **food** on your teeth
causes _____ (3)

Give one way to help **prevent** tooth decay.
_____ (3)



(b) The diagram shows a model of the human **breathing system**.

Which **part** of the body is represented by **A**?

_____ (3)

Which **part** of the body is represented by **B**?

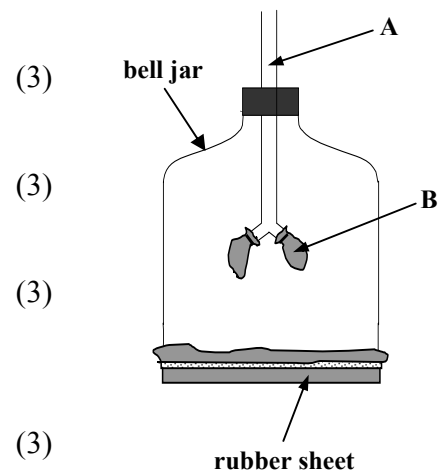
_____ (3)

Which **part** of the body is represented by the **bell jar**?

_____ (3)

What happens to the parts labelled **B** when the **rubber sheet** is pulled down?

_____ (3)



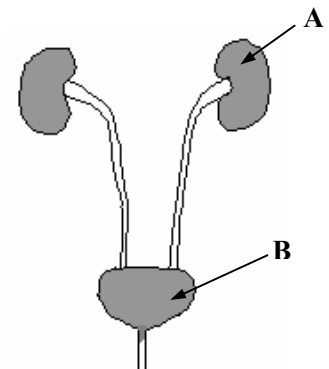
(c) The diagram shows part of the **urinary system** which is involved in excretion.

Name part **A** _____ (3)

Name part **B** _____ (3)

Name the **substance** excreted by the urinary system.
_____ (3)

Name one other **organ** of excretion in the human body.
_____ (3)



Question 9

(a) Name a **habitat** that you have studied. _____ (3)

Name one **animal** that you found in this habitat. _____ (3)

Give **one** example of how this animal is **adapted** to survive in this habitat.

_____ (3)

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

_____ (3)

(b) Plants use different methods to **disperse** (scatter) their seeds. The diagram shows two different types of seeds.

Name the **method** by which the seeds **A** and **B** are dispersed.

Seed **A** _____ (3)

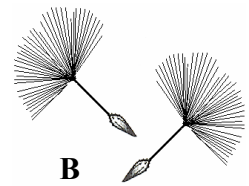
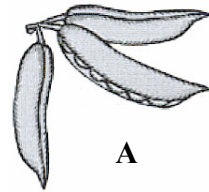
Seed **B** _____ (3)

Give one **reason** why plants need to scatter their seeds.

_____ (3)

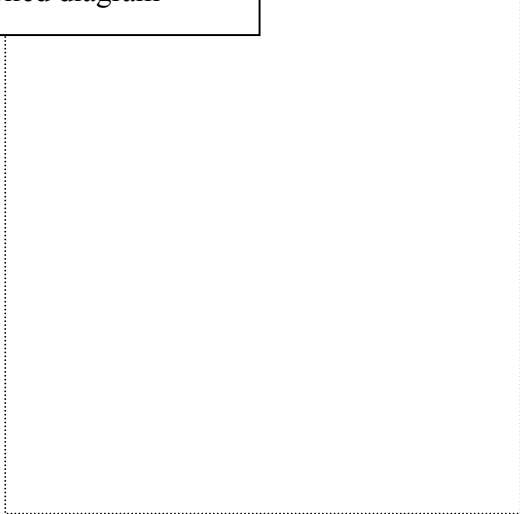
Name the **part** of the flowering plant that produces seeds.

_____ (3)



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

Labelled diagram



Question 10

- (a) **Blood** is found in the **circulatory system**. In each case match a **part of the blood** from the list on the right with its **use** given below.

Used to transport **oxygen**

(3)

Helps fight **infection**

(3)

Helps **clot** the blood

(3)

Name of the **liquid** part of blood

(3)

<p style="text-align: center;">PLASMA</p> <p style="text-align: center;">WHITE BLOOD CELLS</p> <p style="text-align: center;">PLATELETS</p> <p style="text-align: center;">RED BLOOD CORPUSCLES</p>

- (b) The **heart** forms part of the circulatory system. A person's **pulse** is often taken to measure **heartbeat**.

What is the **function** of the heart?

_____ (3)

Name a good **place** in the body to find a pulse.

_____ (3)

Name one factor that causes heartbeat to **increase**.

_____ (3)

Give **one** example of how a person can help keep their heart **healthy**.

_____ (3)

- (c) The human body has a **skeleton** made of bone. Give **two functions** of the skeleton.

1 _____

2 _____

(6)

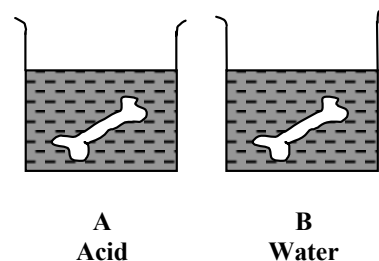
The experiment on the right was set up and left for a few days. One bone was placed in acid and the second in water as shown in the diagram.

What happens to the bone in **A**?

(3)

What happens to the bone in **B**?

(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** from the list on the right to complete the sentences below.

The **earth rotates** on its axis once every _____ hours. (3)

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

A **leap year** occurs once every _____ years. (3)

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

- | |
|------|
| 24 |
| 365¼ |
| 4 |
| 28 |

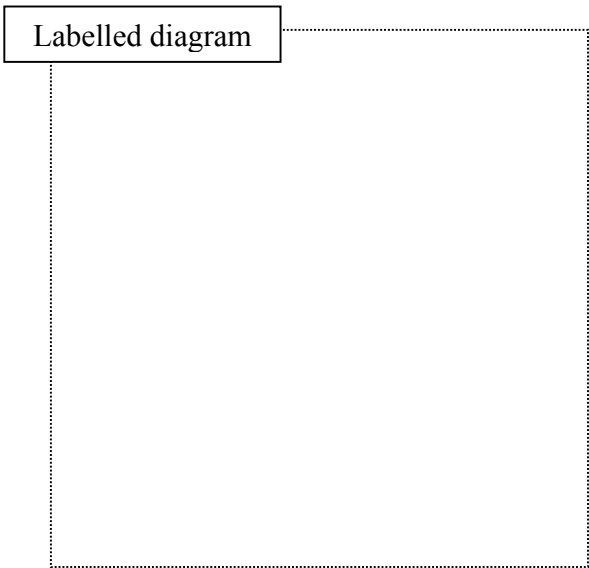
(b) **Humidity** is the amount of _____ in the air. (3)

Humidity can be **measured** using a _____ . (3)

An **anemometer** is used to measure _____ . (3)

A **barometer** is used to measure _____ . (3)

(c) Describe, with the aid of a labelled diagram, an experiment to show **how you would measure rainfall**. (12)



Question 12 - Horticulture

(a) **Soil** is commonly used in the growing of **plants** in horticulture.

Name **one non-living part** of a fertile soil. _____ (3)

Give **two** advantages of having **earthworms** in a soil.

1 _____ 2 _____ (6)

Name a **woody plant** from which you can take cuttings. _____ (3)

(b) A **garden bed** is usually a flat piece of ground specially set aside for growing non-grassy plants.

Name **one** spring bedding plant. _____ (3)

Name one common garden **pest** of bedding plants. _____ (3)

What is the best time of day for **watering** bedding plants? _____ (3)

Give one way in which to **control** weeds around bedding plants.

_____ (3)

(c) Describe, with the aid of a labelled diagram, an experiment to show **how you would measure the air content of a soil or compost**. (12)

Labelled diagram

A - PLASTICS

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

Labelled diagram

B - TEXTILES

- (i) Choose the correct **term** from the list on the right to complete the sentences below

Yarn is **made** from _____. (3)

Yarn is **used** to make _____. (3)

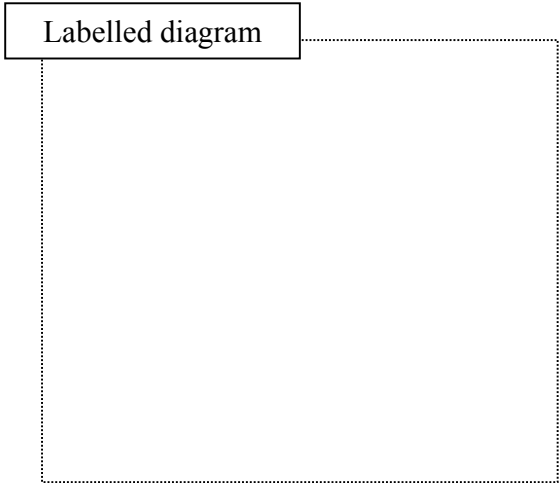
FIBRES
FABRICS

- (ii) Describe, with the aid of a labelled diagram, an experiment to **compare the resistance to wear of two textiles**. (12)

Labelled diagram

C - METALS

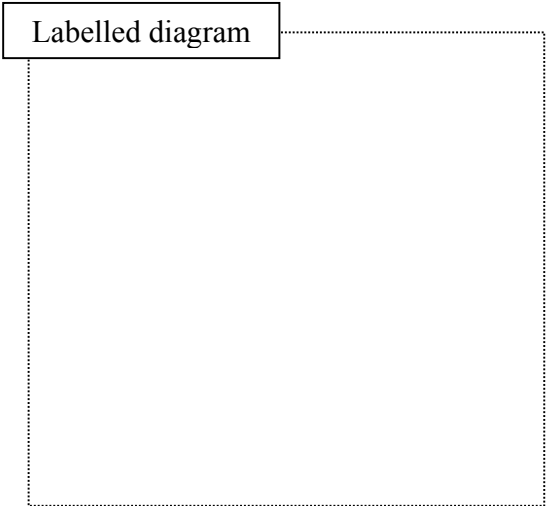
- (i) Name **one** metal that is found **free in nature**. _____ (3)
- (ii) Name **one** metal that is found as an **ore**. _____ (3)
- (iii) Describe, with the aid of a labelled diagram, an experiment to **compare the flexibility of two metals**. (12)



D - TIMBER

- (i) In each case choose the correct **term** from the list on the right to complete the sentences below.
Trees with **needle-like leaves** form _____ **wood**. (3)
Trees with **broad leaves** form _____ **wood**. (3)
- (ii) Describe, with the aid of a labelled diagram, an experiment to **show that grain direction affects the bending strength of timber**. (12)

SOFT
HARD



Question 14 - Food

(a) In each case match a **food** from the list on the right with a method of preservation below.

Dehydration _____ (3)

Pasteurisation _____ (3)

Pickling _____ (3)

Freezing _____ (3)

ONIONS

MILK

COFFEE

FISH

(b) **Food additives** are used in many foods.

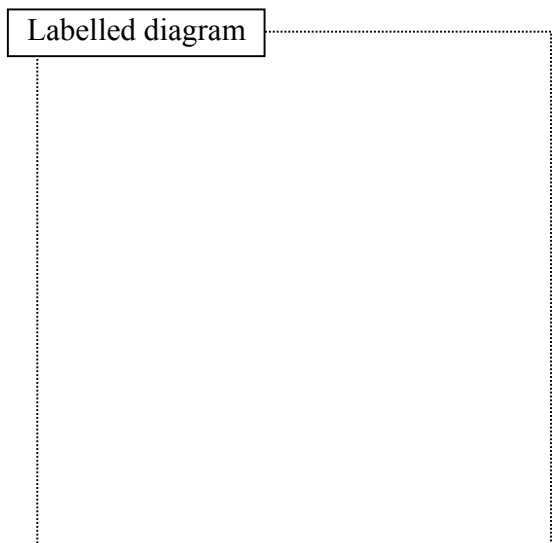
Give **two uses** of additives, other than preservation.

1 _____ 2 _____ (6)

Give **one harmful effect** of a food additive. _____ (3)

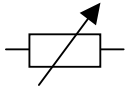
What type of **food additive** is E 102? _____ (3)

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



Question 15 - Electronics

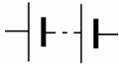
(a) In each case match an electric component from the list on the right with each of the following symbols.



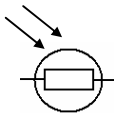
(3)



(3)



(3)



(3)

VARIABLE RESISTOR

LDR

AMMETER

BATTERY

(b) Name the type of **switch** shown in the circuit.

_____ (3)

Will the **LED light** when the circuit is closed?

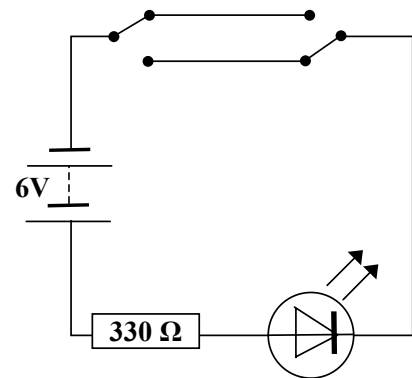
_____ (3)

What is the function of the **resistor** in the circuit?

_____ (3)

Where in a house might you find this type of switch?

_____ (3)



(c) You are given a **battery**, a **resistor** and **two LEDs**. Draw a circuit where the **LEDs** are **connected in parallel** and **both will light**. (12)

Circuit diagram

Question 16 - Energy Conversions

(a) In each case match an **energy change** from the list with that occurring in each of the following.

ELECTRICAL TO HEAT	KINETIC TO SOUND
CHEMICAL TO HEAT	CHEMICAL TO LIGHT

- A match **burning** _____ (3)
- A drum skin **vibrating** _____ (3)
- A **battery** torchlight **shining** _____ (3)
- An **electric** kettle **boiling** water _____ (3)

(b) The diagram shows the parts of a simple **electromagnet**.

What **metal** is used to make the core?

_____ (3)

Is an electromagnet a **temporary** or **permanent** magnet?

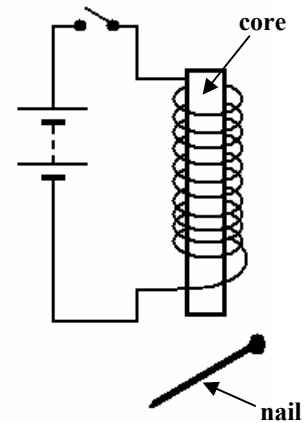
_____ (3)

What happens to the **nail** when the switch is closed?

_____ (3)

Give **one** everyday use of an electromagnet.

_____ (3)



(c) Describe, with the aid of a labelled diagram, a laboratory experiment to **show that energy can be released from food, e.g. peanuts**. (12)

Labelled diagram

