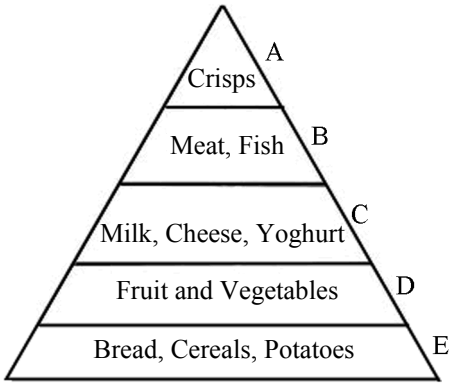
Biology

Question 1 (52)

For examiner use only

(1) (2)

(*a*) The diagram is of a food pyramid.



(*i*) Name one other food from level **B**.

Food _____

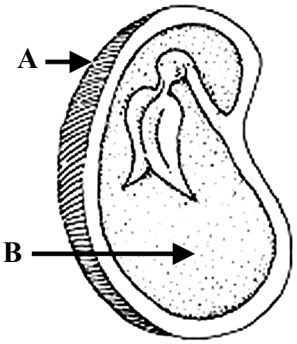
(*ii*) What is the dietary reason why the area of level **A** is much less than the area of level **E** in the food pyramid?

Why? _____

(*b*) Complete the word equation for photosynthesis.

carbon dioxide + _____ ⟶ _____ + oxygen

(*c*) The diagram is of a section through a seed showing its structure.



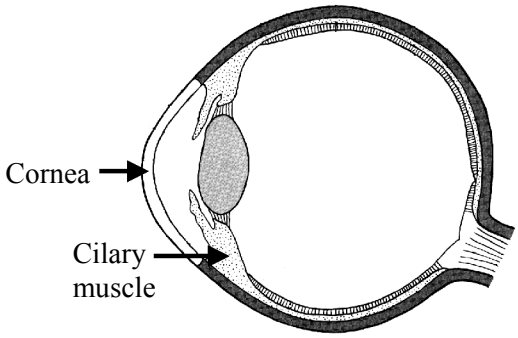
Name the parts labelled **A** and **B** in the diagram.

Name of **A** _____

Name of **B** _____

(*d*) The diagram shows the human eye.

Give the functions of the cornea and of the cilary muscle.



Function of cornea _____

_____

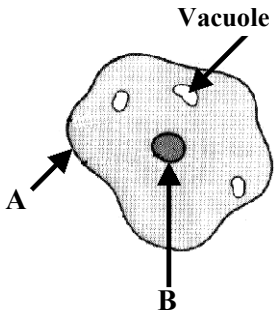
Function of cilary muscle _____

_____

_____

For examiner use only	
(1)	(2)

(*e*) The diagram shows an animal cell. Name part **A**.

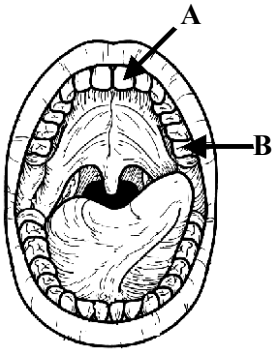


Name of **A** _____

What important structures are located in **B**?

What? _____

(*f*) The diagram shows the inside of a human mouth. Give the name of tooth type **A**.



Name _____

What is the function of tooth type **B**?

Function _____

(*g*) Name one invertebrate animal and one vertebrate animal.

Invertebrate _____

Vertebrate _____

(*h*) Four methods of waste management are: **composting**, **incineration**, **landfill** and **recycling**.

(*i*) Pick **two** from the list and state how each works. The name of the selected method must be given with each.

First name _____

How it works _____

_____

Second name _____

How it works _____

_____

(*ii*) Give **one** advantage and **one** disadvantage of a named method.

Method _____ Advantage _____

Disadvantage _____

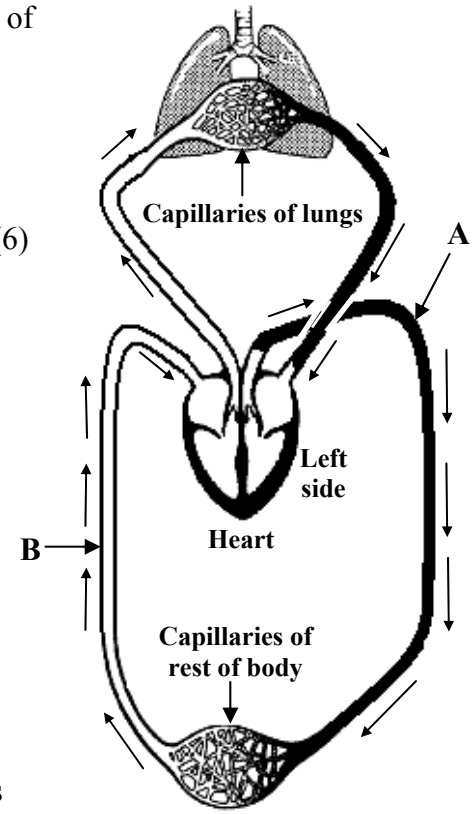
(7 × 6 + 1 × 10)

Question 2 (39)

For examiner use only

(1) (2)

(*a*) The simplified diagram shows the flow of blood through the lungs, heart and the rest of the body.



(*i*) Name the blood vessels labelled **A** and **B**. (6)

A _____

B _____

Capillaries are small blood vessels.

(*ii*) Describe **two** changes in the composition of blood after it has passed through the capillaries of the lungs shown. (6)

1 _____

_____

2 _____

_____

What feature of capillaries allows these changes to happen? (3)

_____

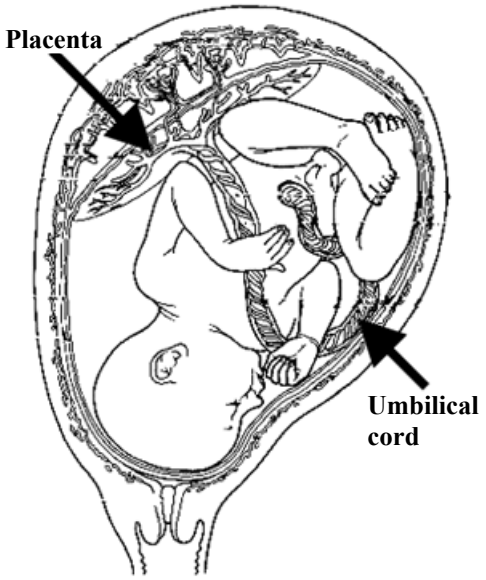
(*iii*) Name the chamber of the heart that pumps blood to the lungs. (3)

_____

For Examiner use only

(1) (2)

(*b*) The diagram shows a baby in the womb. The placenta and umbilical cord are labelled.



(*i*) Give **two** functions of the placenta. (6)

1 _____

_____

_____

_____

_____

2 _____

_____

(*ii*) What is the function of the umbilical cord, which connects the baby to the placenta? (3)

What? _____

_____

(*iii*) Describe, briefly, **four** events that occur at the end of pregnancy (i.e. just before birth, at birth and just after birth). (12)

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

Question 3 (39)

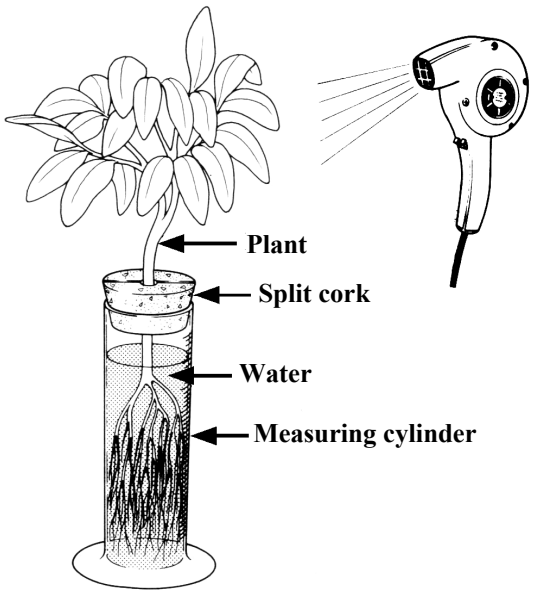
For examiner use only

(*a*) Water vapour leaves plants through pores in their leaves into the atmosphere. (1) (2)

(*i*) What is this loss of water by plants called? (3)

_____

A pupil did an experiment to investigate this loss of water by plants.
The apparatus that she used is shown in the diagram.
The rate at which the water level fell (water loss) in the measuring cylinder was measured at regular time intervals, first for a plant without the hair dryer (normal plant) and then for a plant with a hair dryer blowing warm air over the leaves (blown plant).



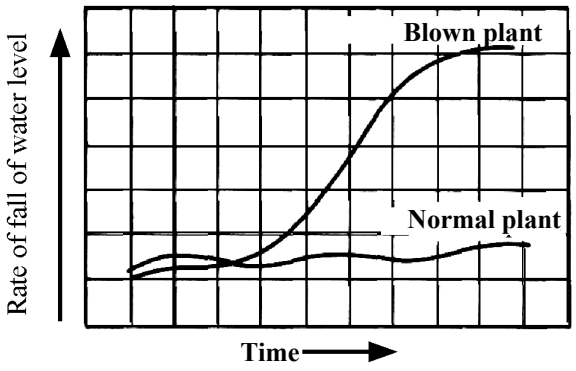
The pupil used the data obtained to draw the graph below.

(*ii*) Examine the graph and comment on the rate of water loss by the 'normal plant'. (3)

_____

_____

_____



(*iii*) Examine the graph and comment on the rate of water loss by the 'blown plant'. (3)

_____

_____

(*iv*) What **two factors** were different for the 'blown plant'? (6)

1 _____

2 _____

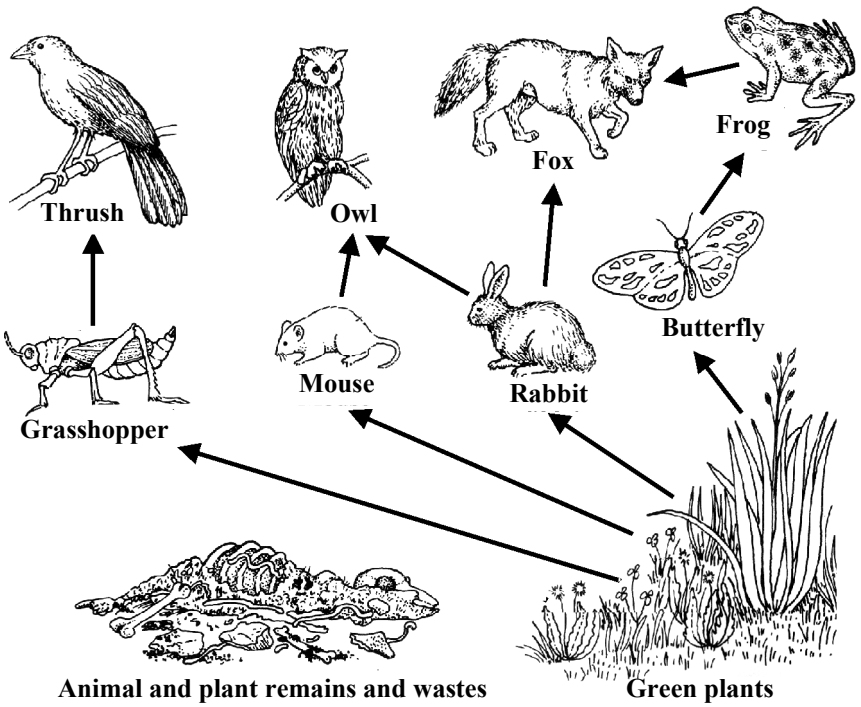
(*v*) Name the tissue that transports water up the plant from roots to leaves. (3)

_____

For examiner use only

(1) (2)

(*b*) The diagram shows a simplified food web from a mixed habitat.



Answer the following questions using only <u>items from the diagram</u> above in your answers. (21)

(*i*) Write a food chain with three members.

_____

(*ii*) Decomposers are not shown in the diagram.
What would decomposers feed on?

_____

(*iii*) Give **one** example of adaptation.

_____

(*iv*) Name **two** animals that might be in competition.

1 _____ **2** _____

(*v*) What is meant by the term interdependence?
Give an example of interdependence.

_____

_____

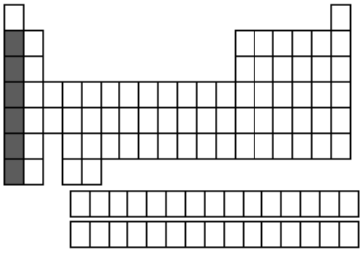
_____

Chemistry

For examiner use only

Question 4 (52) (1) (2)

(*a*) The diagram is an outline periodic table. One area, a group of elements, is shaded.



Name this group of elements and give one chemical property that they have in common.

Group _____

Property _____

(*b*) Describe how to measure the pH of lemon juice.

Describe _____

_____

_____

(*c*) What are *isotopes*?

What? _____

_____

_____

(*d*) The photograph shows severe rusting of the steel body of a motorcar.
Give one condition necessary for rusting to occur. Describe one method of preventing rust happening.

Condition _____

_____

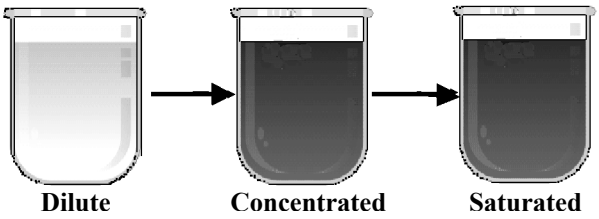
Method _____

_____

For examiner use only

(1) (2)

(*e*) The diagram shows three solutions of copper sulfate.



Starting with a dilute solution state how to make it more concentrated.

State _____

How do you know when a saturated solution has been produced?

How? _____

(*f*) Complete the equation:

$2HCl + CaCO_3$ ⟶

(*g*) Name a catalyst that you have used in the school laboratory and give a reaction that it catalyses.

Catalyst _____

Reaction _____

(*h*) Pollution by non-biodegradable plastics, produced from petroleum, has a significant damaging effect on the environment.
Give **two** of these damaging effects.

1 _____

2 _____

Explain the term *non-biodegradable*.

Explain _____

A biodegradable bottle is shown in the image.

Some are made from starch, vegetable oil etc., and are called bioplastics.

Others are made from petroleum with additives.

Suggest an advantage of bioplastics over petroleum-based biodegradable plastics.

_____

_____

(7 × 6 + 1 × 10)

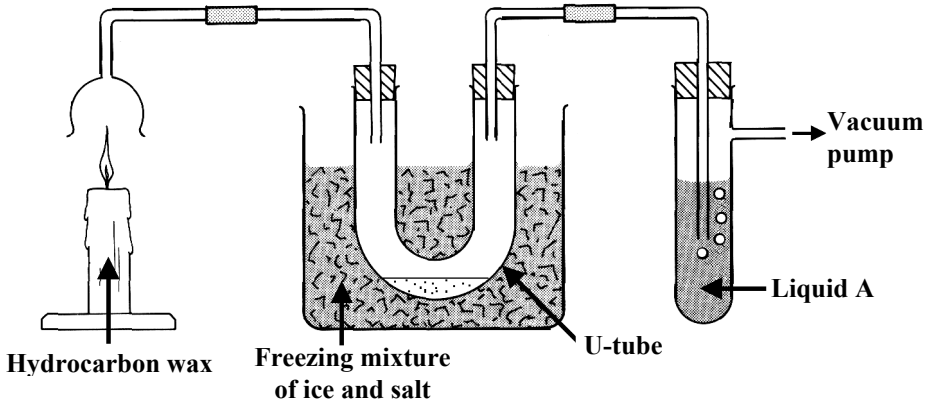
Question 5 (39)

For examiner use only

(1) (2)

(*a*) The experiment shown in the diagram was carried out to investigate the products of the combustion of a hydrocarbon wax produced from the fossil fuel oil.

In the experiment the products of the combustion were drawn through the apparatus by the vacuum pump.



A colourless liquid formed at the bottom of the U-tube after a while. Liquid A was clear and colourless at the start of the experiment and it slowly became milky.

(*i*) What do you think the liquid that formed in the U-tube was? Give a test that could be used to confirm your identification. (9)

What? _____

Test _____

_____

_____

(*ii*) Identify **liquid A** and state why it went milky. (6)

Liquid A _____

State _____

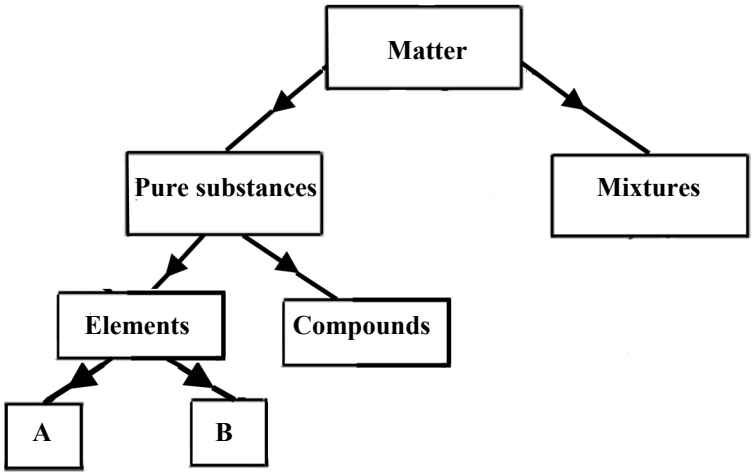
(*iii*) Name a fossil fuel other than oil. (3)

Name _____

For examiner use only

(1) (2)

(*b*) Matter is the 'stuff' that all things are made of, including us.
The diagram shows how some types of matter are classified.
The diagram is not complete.



(*i*) Distinguish between elements and compounds. (6)

_____

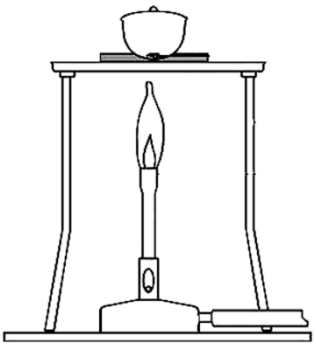
_____

(*ii*) Elements are often divided into two sub-groups.
Name these two sub-groups. (6)

_____ & _____

(*c*) The apparatus shown in the diagram was used to strongly heat 2.4 g of magnesium in a crucible. The lid of the crucible was lifted a little during the heating.

A white powder, with a mass of 4.0 g, was produced.



(*i*) Why was there an increase in mass? (3)

_____

_____

(*ii*) Where did the extra mass come from? (3)

_____

(*iii*) Give the name or formula of the white powder. (3)

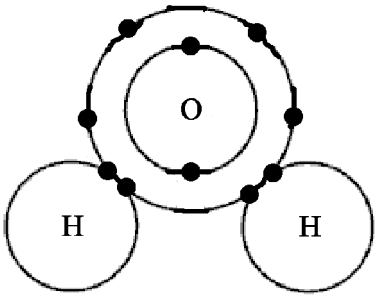
_____

Question 6 (39)

For examiner use only

(1) (2)

(*a*) The diagram shows the way the atoms bond together in a molecule of water.



(*i*) What is a molecule? (3)

_____

_____

_____

(*ii*) Each hydrogen atom shares two electrons with the oxygen atom. What name is given to the type of bonding that involves the sharing of pairs of electrons? (3)

_____

(*iii*) In the space below, draw a diagram of a methane molecule, $\mathbf{CH_4}$, showing the bonding between its atoms. (6)

(*iv*) Describe a second type of chemical bonding and name a compound which has this type of bonding. (9)

Describe _____

_____

_____

_____

Compound _____

(*b*) Water hardness is a common problem.

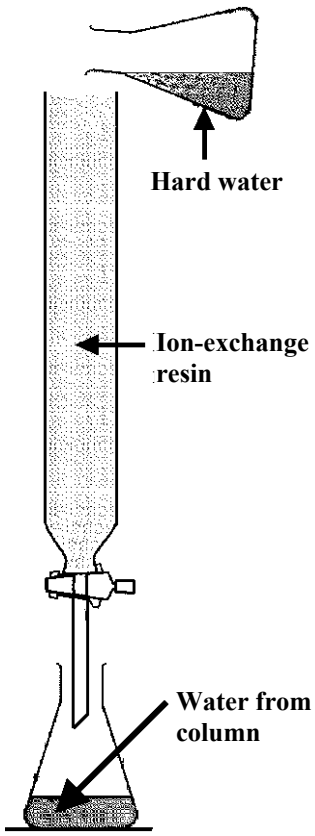
(*i*) Describe a test that distinguishes between hard and soft water. (6)

_____

_____

_____

_____



(*ii*) Name a compound that causes hardness when it dissolves in water. (3)

_____

(*iii*) Examine the diagram.
Would you expect the water from the column of resin to be hard or soft?
Justify your answer. (3)

_____

_____

How could you test the water to confirm this answer?
What result would you expect? (6)

_____

_____

_____

_____

For examiner use only

(1) (2)

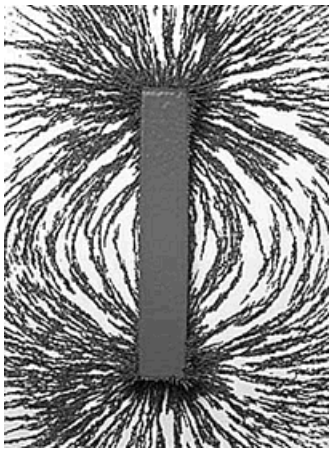
Physics

Question 7 (52)

For examiner use only

(1) (2)

(*a*) What causes the iron filings to form the pattern around the magnet seen in the photograph?



What? _____

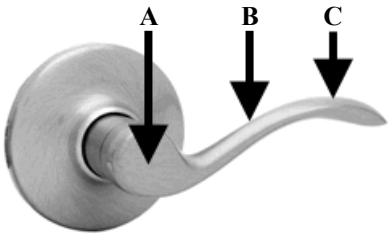
_____

How would you determine the position of the north pole of the magnet?

How? _____

(*b*) The door handle is an application of a lever.

The labels and arrows show three points.



Which of the points **A**, **B** or **C** represent

(*i*) the fulcrum (turning point),

(*ii*) the point where the smallest force will open the door lock.

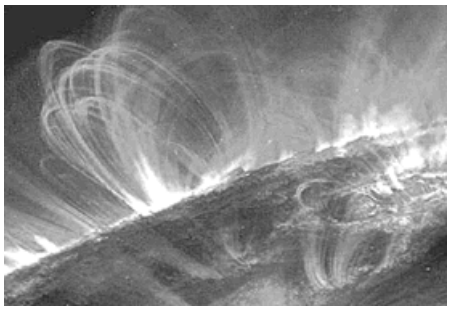
(*i*) _____ (*ii*) _____

(*c*) Explain the term *friction*. How can friction be reduced?

Explain _____

How? _____

(*d*) The photo shows part of the surface of sun. Give **two** examples showing that the sun is our primary source of energy.



1 _____

_____

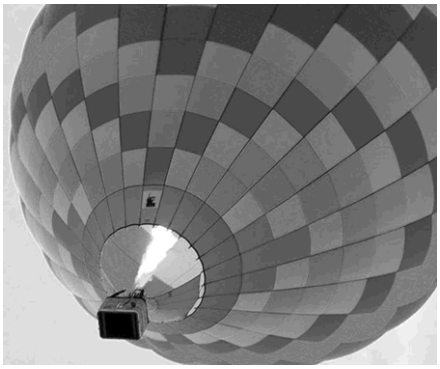
2 _____

_____

For examiner use only

(1) (2)

(*e*) The photo shows a hot air balloon.



Why does the balloon rise when the air inside is heated?

Why? _____

_____

(*f*) Describe a simple experiment to show that sound is a form of energy.

Describe _____

_____

(*g*) The boy in the photo is touching a charged globe that is at high voltage. He is insulated from the earth.

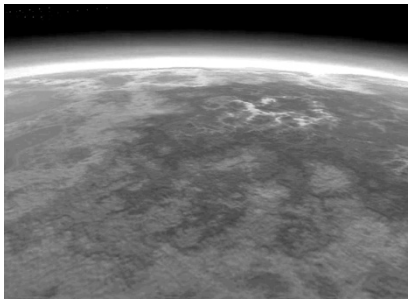
What property of electric charge causes the boy's hair to stand on end and apart?

What? _____

_____

_____

(*h*) The Earth's atmosphere seen from space is the thin curve at the top of the photo.



(*i*) Name the force that holds the atmosphere to the Earth.

Name _____

This force gives the atmosphere weight and causes atmospheric pressure.

(*ii*) Define pressure and give the unit for pressure.

Define _____ Unit _____

(*iii*) Why does atmospheric pressure decrease with height?

Why? _____

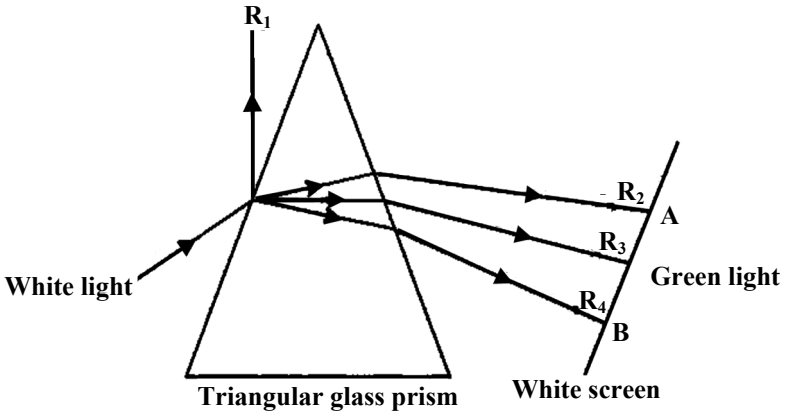
(7 × 6 + 1 × 10)

Question 8 (39)

For examiner use only

(1) (2)

(*a*) A narrow beam (ray) of white light is directed onto a triangular glass prism as shown in the diagram.



The paths of four rays: **R_1**, **R_2**, **R_3** and **R_4** produced from this ray of white light are shown in the diagram.

(*i*) Ray one (R_1) is deflected off the prism as shown in the diagram.
What word is used to describe the deflection of ray one (R_1)? (3)

_____

(*ii*) Rays two, three and four (R_2, R_3, and R_4) enter and leave the prism and change direction each time.
What is this change of direction of light called? (3)

_____

(*iii*) A single ray of white light enters the prism and a band of light of many colours leaves the prism. Just three of the emergent rays are shown in the diagram.
The coloured rays are produced from the white light.
What is this separation of white light into coloured light called? (3)

_____

(*iv*) Give the colour of light that can be seen at the extreme ends **A** and **B** on the white screen. (6)

A _____ **B** _____

(*v*) Name a natural phenomenon that produces a band of coloured light from sunlight. (3)

Name _____

For examiner use only

(1) (2)

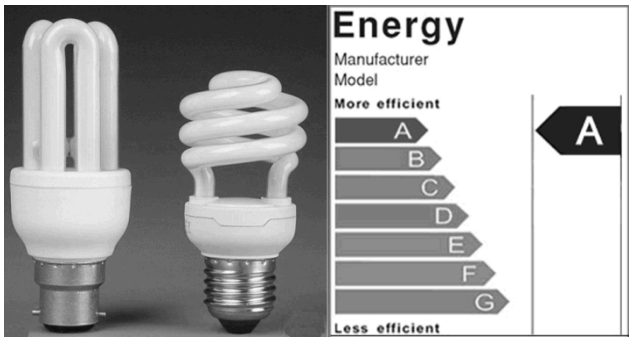
(*b*) Compact fluorescent lamps (**CFL**s) are more energy efficient than incandescent (tungsten filament) bulbs. A 20 W (0.02 kW) CFL bulb has the same light output as a 115 W (0.115 kW) incandescent bulb.

If incandescent (tungsten filament) bulbs were replaced by compact fluorescent lamps (**CFL**s) in Ireland it is estimated that this would reduce our CO_2 emissions by 700,000 tonnes each year and reduce our household electricity bills by €185,000,000.

(*i*) Why would replacing incandescent bulbs lower our CO_2 emissions? (3)

_____

Compact fluorescent lamps (**CFL**s), shown in the photograph, have a **Grade A** rating (efficiency rating).



Electrical energy is converted into light and one other form of energy in bulbs.

(*ii*) Name this second form of energy. (3)

_____

(*iii*) Which form of energy does the more efficient bulb produce more of? (3)

_____

A 20 W (0.02 kW) CFL bulb is equivalent to 115 W (0.115 kW) incandescent bulb. Electricity costs 15 cent per kW h.

(*iv*) Calculate the cost of using each of these bulbs for 100 hours. (9)

Cost for the CFL _____

_____

Cost for the incandescent bulb _____

_____

(*v*) Name another electrical appliance where checking the energy efficiency rating would be important to save money on running costs. (3)

_____

Question 9 (39)

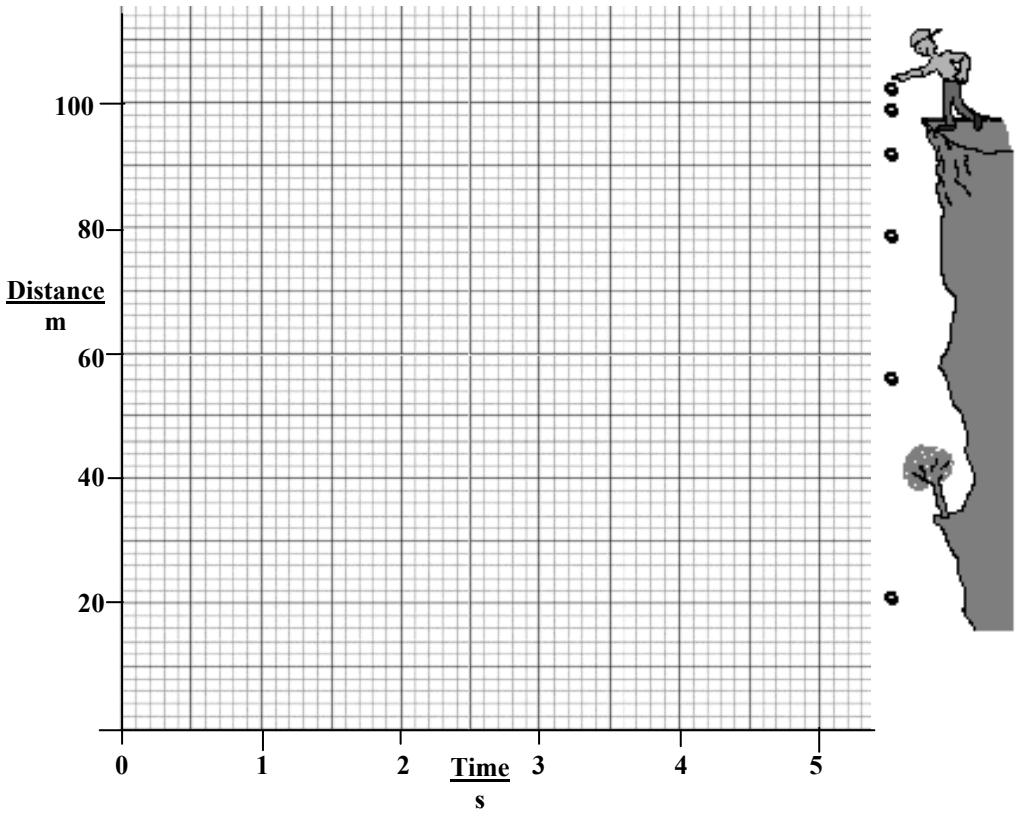
For examiner use only

(1) (2)

(*a*) A stone was dropped from the top of a cliff and the distance that it fell was measured at the intervals of time as given in the table below.

Distance (m)	0	5	20	45	80	**100**
Time (s)	0	1	2	3	4	**4.5**

(*i*) Draw a graph of distance against time in the grid below.
A smooth curve through the plotted points is required. (9)



(*ii*) Use the graph to find how far the stone had fallen in 3.5 s. (3)

_____

(*iii*) Calculate the average speed of the falling stone between the second and the fourth second. Give the unit with your answer. (6)

_____

(*iv*) In this experiment is distance fallen directly proportional to time? Justify your answer. (6)

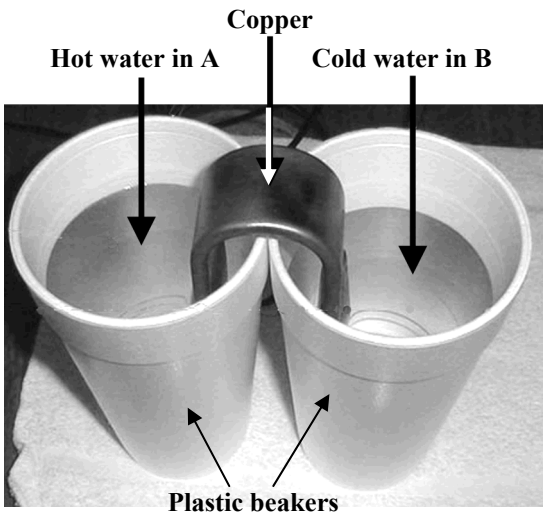
_____

_____

For examiner use only

(1) (2)

(*b*) The experiment shown in the photograph was set up by a student.



(*i*) What changes take place to the water in the beakers **A** and **B** as time passes? (3)

_____

_____

_____

(*ii*) Explain why these changes occur. (6)

_____

_____

(*iii*) What instrument would be used, in this experiment, to monitor the changes? (3)

_____

(*iv*) Name a material to replace copper in this experiment that will not allow these changes to occur. (3)

_____