



Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2007

SCIENCE (REVISED SYLLABUS) – ORDINARY LEVEL

THURSDAY, 14 JUNE – MORNING, 9.30 to 11.30

INSTRUCTIONS

1. Write your **examination number** in the box provided on this page.
2. Answer **all** questions.
3. Answer the questions in the spaces provided in this booklet. If you require extra space, there is a blank page provided at the back of this booklet.

Centre Number

Examination Number

For examiner use only	
Section/Question	Mark
Biology	
Q.1 (52)	
Q.2 (39)	
Q.3 (39)	
Chemistry	
Q.4 (52)	
Q.5 (39)	
Q.6 (39)	
Physics	
Q.7 (52)	
Q.8 (39)	
Q.9 (39)	
Total (Paper) (390)	
Bonus for Irish	
Grand Total (Paper) (390)	
Coursework A (60)	
Coursework B (150)	
Grand Total (600)	
Grade	

Biology

Question 1

(52)

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- (a) The picture shows a piece of laboratory equipment.

Name the piece of equipment.

Name _____

Give one **use** of this piece of equipment.

Use _____







(1) | (2)

- (b) Protein and carbohydrate form part of a balanced diet.

In the table on the right write the letter **P** beside a good source of **protein**.

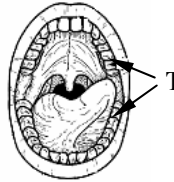
Write the letter **C** beside a good source of **carbohydrate**.

	Carrot	
	Cheese	
	Fish	
	Potato	

- (c) Two teeth are labelled **T** in the diagram.

In the table on the right write the letter **T** beside the type of **tooth** labelled **T**.

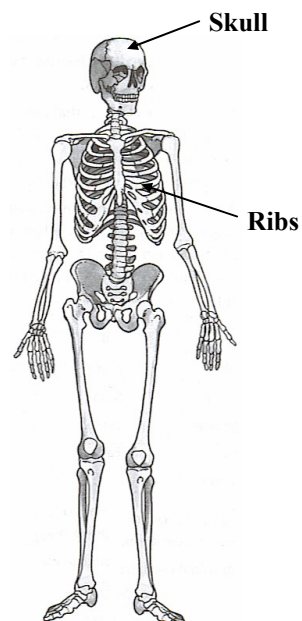
Write the letter **F** beside the **function** of that type of tooth.

	Canine	
	Chewing	
	Incisor	
	Molar	
	Tearing	

- (d) In the table below place the letter **S** beside the name of an **organ protected by the skull**.

Write the letter **R** beside the name of an **organ protected by the ribs**.

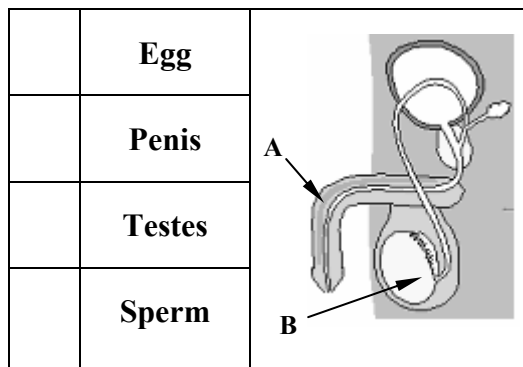
	Brain
	Heart
	Stomach
	Kidney



(e) The diagram shows the **male reproductive system**.

In the table on the right write the letter **A** beside the name of **the part** labelled A.

Write the letter **B** beside the name of a **substance produced** by B.



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(1) | (2)

(f) Choose **one vertebrate** and **one invertebrate** from the list of animals on the right.

Invertebrate _____

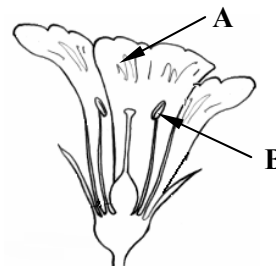
Vertebrate _____

SNAIL
MOUSE
FOX
EARTHWORM

(g) Name the parts labelled **A** and **B** in the diagram of the flower.

Name of part A _____

Name of part B _____

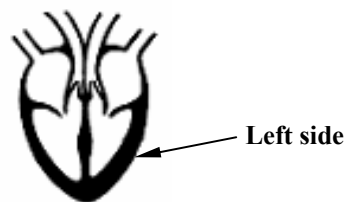


(h) The diagram shows the human heart.

Blood moves through vessels called arteries and veins.

In the table on the right write the letter **A** beside the name of the **blood vessels that carry blood away from the heart**.

Write the letter **T** beside the name of the **blood vessels that carry blood to the heart**.



	Arteries
	Veins

Why is the wall of the **left side** of the heart **thicker than** the wall on the **right side**? _____

(7 × 6 + 1 × 10)

Question 2

(39)

- (a) In each case, choose the correct part of the human body from the list on the right to complete the following sentences. (12)

- | |
|--|
| <p>EYE
JOINT
KIDNEY
MUSCLE</p> |
|--|

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(1) (2)

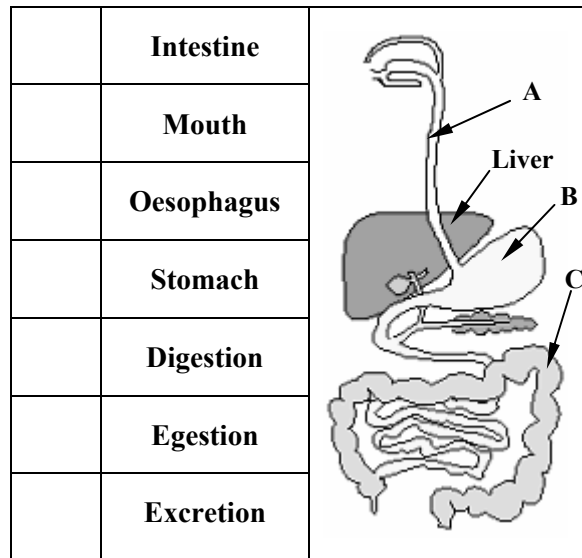
The _____ detects light.

The _____ is a human **organ of excretion**.

The structure formed where **two bones meet** is called a _____.

The tissue that **causes movement** of joined bones is called _____.

- (b) The diagram below shows the **human digestive system**.
Examine the diagram and answer the questions that follow.



In the table write the letter **A** beside the name of **the part** labelled **A**.

Write the letter **B** beside the name of **the part** labelled **B**.

Write the letter **F** beside the **function** of the part labelled **B**. (9)

The large intestine is labelled **C** in the diagram.

State one **function of the large intestine**. (3)

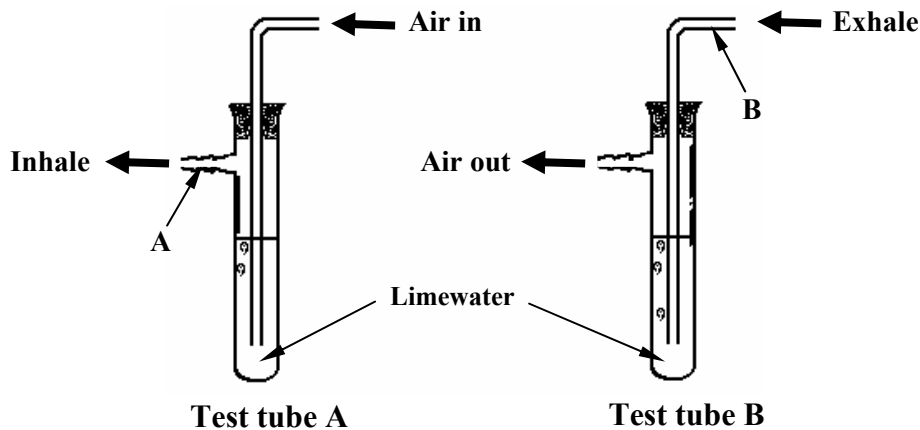
Fibre is a carbohydrate and it is an important part of a balanced diet.

What is the **function of fibre** as part of a balanced diet? (3)

- (c) In an investigation to **compare the amount of carbon dioxide in inhaled and exhaled air** a student set up the apparatus drawn below. **Limewater** was placed **in test tube A** and **in test tube B**.

The student **inhaled** (breathed in) air **through part A** of **test tube A** so that the air was passed through the limewater.

The student then **exhaled** (breathed out) through **part B** of **test tube B** so that the exhaled air was passed through limewater.



- (i) What effect has carbon dioxide on limewater? (6)

The student **inhaled through test tube A** and **exhaled through test tube B** twenty times.

The student saw **no change** in the appearance of the limewater **in test tube A**.

The appearance of the limewater in **test tube B** had **changed**.

- (ii) What **change** would you expect the student to have seen **in the limewater in test tube B**? (3)

- (iii) What **conclusion** should the student have drawn from **what he/she saw**? (3)

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(1) (2)

Question 3

(39)

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(a) The diagram shows a plant that was left in sunlight for a few days.

A test was carried out in the laboratory on a part of the plant to see if it had made food (starch).

Answer the following questions using the table.


(1) (2)

(15)

Write the letter **F** beside the **name of the process** by which plants **make food**.

Write the letter **P** beside the name of the **part** of the plant **where most of the food (starch) is made**.

Write the letter **C** beside the name of the **substance** which gives plants their **green colour**.

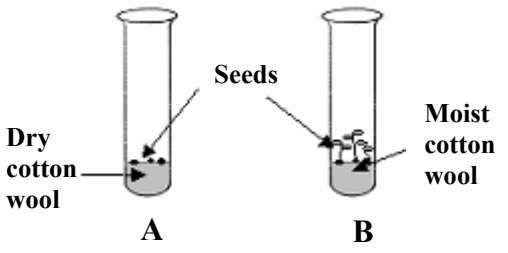
	Chlorophyll	
	Flower	
	Iodine	
	Leaf	
	Litmus	
	Photosynthesis	
	Respiration	

Write the letter **S** beside the name of the **chemical** that produced a **blue-black colour** when it is used to **test for starch**.

(b) A number of cress seeds were set up as shown in the diagram and left for a few days at a suitable temperature to **investigate one of the conditions necessary for germination**.

The seeds in test tube B germinated.

Study the diagram and answer the questions below using the table.

	Air	
	Suitable temperature	
	Water	
	15 °C	
	1 °C	

Write the letter **X** in the table beside the condition **present in B** but **not present in A** which allowed the seeds in **B** to germinate.

(3)

At which temperature, **1 °C** or **15 °C**, would the seeds be most likely to germinate?

Write the letter **T** in the table beside your choice.

(3)

(c) **Phototropism** is the name given to a plant's response to light.

(i) **How** do plants respond to light? (6)

(ii) Describe, with the help of a labelled diagram, how you could set up an **investigation to show how plants respond to light.**

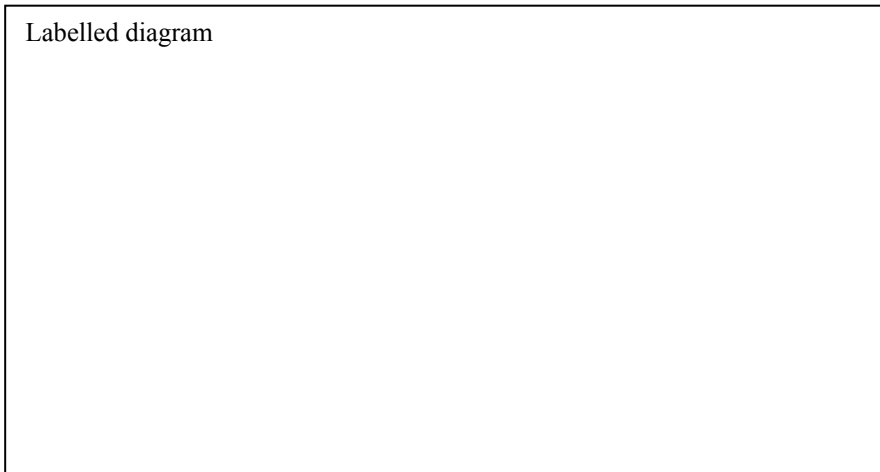
Use the headings below. (12)

Equipment: _____

Procedure: _____

Result: _____

Labelled diagram



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(1) | (2)

Chemistry

Question 4

(52)

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(a) What is the **name** the piece of equipment shown on the right.



Name _____

Give one **use** of this piece of equipment.

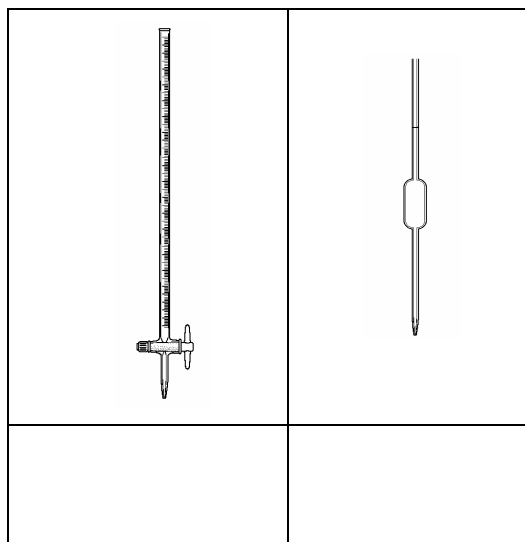
Use _____

(1) (2)

(b) Two pieces of laboratory glassware are drawn on the right.

In the table write the letter **P** under the drawing of a **pipette**.

Write the letter **B** under the drawing of a **burette**.

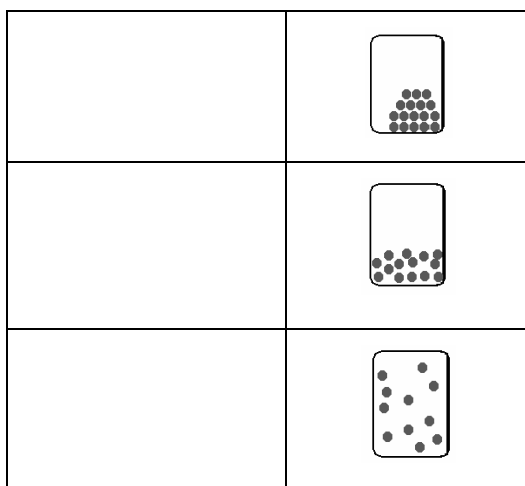


(c) The three states of matter are **solid**, **liquid** and **gas**.

The diagram shows the arrangement of particles in the three states of matter.

In the table write the letter **S** beside the arrangement of particles in a **solid**.

Write the letter **G** beside the arrangement of particles in a **gas**.



(d) In the table on the right write the letter **A** beside the name of each of the **two alloys** listed.

	Aluminium
	Brass
	Diamond
	Iron
	Solder

(e) In the table on the right write the letter **W** beside the name of each of the **two elements** present in **water**.

	Carbon
	Hydrogen
	Nitrogen
	Oxygen

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(1) | (2)

(f) Plastics are widely used to make bottles, lunchboxes etc. From which material listed on the right are most plastics manufactured? _____

Alcohol
Crude oil
Water

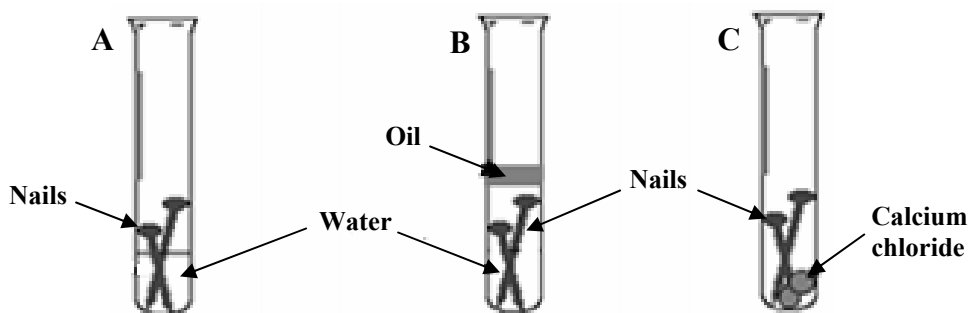
Give **one reason** why plastics are suitable for the uses above.

(g) Complete the following sentence below inserting the correct words from the list on the right.

All the known _____ are listed in the _____.

Atoms
Elements
Compounds
Periodic table

(h) The diagram shows three experiments which were set up to investigate **rusting**. Study the diagram and answer the questions below.



In which test tube, **A**, **B** or **C**, will the nails rust? _____

Why is the water in test-tube **B** **boiled** and **cooled** and then **covered with a layer of oil**?

(7 × 6 + 1 × 10)

Question 5

(39)

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- (a) Separation techniques are very important in chemistry.
The apparatus in the diagram was used to separate sea-water.
Study the diagram.

(1) (2)

Complete the table correctly matching the labels A – F in the diagram with words/phrases in the table.

(18)

	Bunsen	
	Cold water in	
	Condenser	
	Thermometer	
	Tripod stand	
	Water out to sink	

What is the **name** given to the separation technique shown in the diagram above?

(3)

Technique _____

- (b) What is the **name** given to the separation technique shown in diagram on the right?

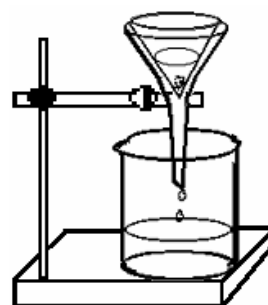
(3)

Name _____

Name **two** substances which could be separated using this technique.

(3)

Substances _____ and _____

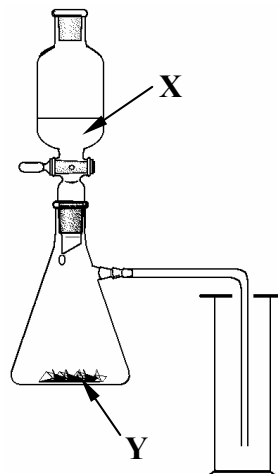


(c) The diagram shows an arrangement of apparatus suitable for the preparation of **carbon dioxide gas** in a school laboratory.

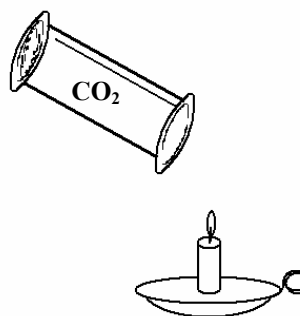
Name suitable substances **X** and **Y** from which carbon dioxide can be made. (6)

X _____

Y _____



The diagram shows a gas jar of **carbon dioxide** gas being poured onto a lighting candle. The candle quenches (goes out).



This test **demonstrates two properties** of carbon dioxide gas.

State these two properties. (6)

1 _____

2 _____

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(1) (2)

Question 6

(39)

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(a) The sentences below have words omitted.

Complete the table on the right correctly matching the numbers 1 – 5 with the words in the table.

(18)

Neutrons and 1 are **located in the nucleus** of atoms.

The 2 move around **outside the nucleus** of atoms.

The 3 have **no electric charge**.

In 4 bonding **pairs of electrons are shared**.

In 5 bonding **positive ions are attracted to negative ions**.

	Covalent
	Electrons
	Ionic
	Neutrons
	Protons

(1)

(2)

(b) Fossil fuels are sources of hydrocarbons.

Name **one element** found in **all hydrocarbons**.

(3)

The burning of fossil fuels can give rise to acid rain.

(3)

Give one **harmful effect** of **acid rain**.

Natural gas is mainly composed of one particular hydrocarbon.

In the table below place the letter **N** beside the name of this gas.

(3)

	Helium
	Hydrogen
	Methane
	Oxygen

(c) Describe, with the help of a labelled diagram, how you could **investigate** simple household substances to see if they were **acidic, basic** or **neutral**.

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(1) | (2)

Use the headings below.

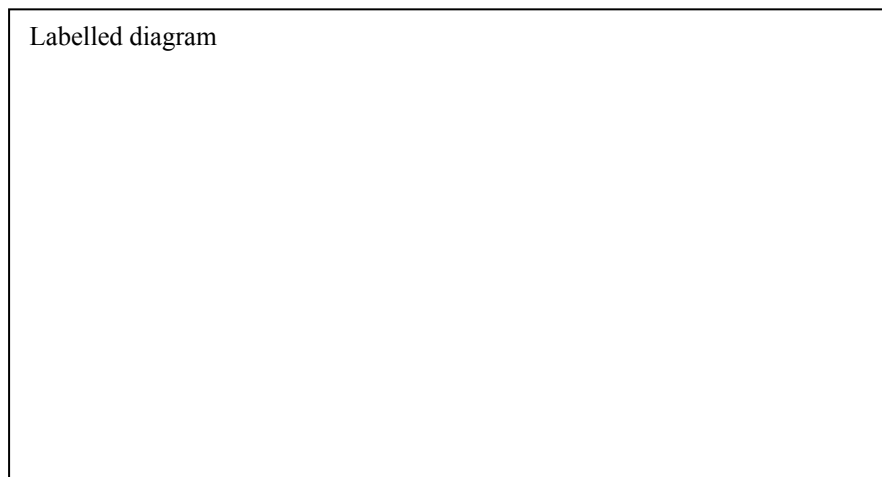
(12)

Equipment and chemicals: _____

Procedure: _____

Result: _____

Labelled diagram



Physics

Question 7

(52)

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- (a) Different units are used to measure different physical quantities.

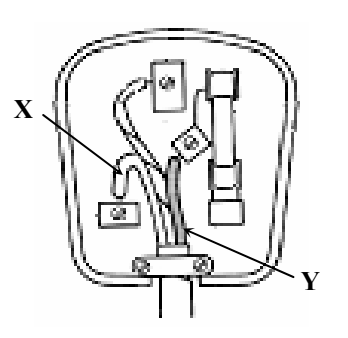
In the table on the right write the letter **L** beside the unit of **length**.
Write the letter **W** beside the unit of **weight**.

	Metre
	Newton
	Joule

(1) (2)

- (b) The diagram shows a three-pin plug with the back removed.
In the table below write the letter **X** beside the name of the **wire** labelled **X** in the diagram.


Write the letter **C** beside the **colour** of the **insulating** on the wire labelled **Y**.

	Earth	
	Live	
	Neutral	
	Brown	
	Blue	

- (c) The speed of a car is 15 m s^{-1} .

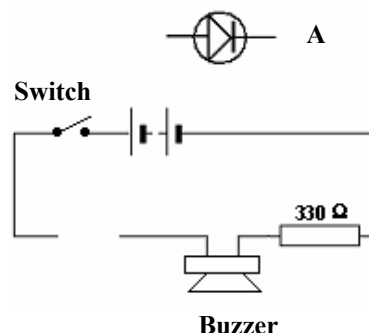
In the table write the letter **D** beside the **distance** the car will travel in 5 seconds.

Write the letter **F** beside the word that describes what happens when the **speed of a car increases**.

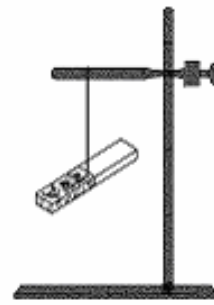
	3 m	
	75 m	
	Acceleration	
	Force	

- (d) **Identify device labelled A** on the right.

Complete the circuit **inserting** the symbol for the **device A** so that the buzzer would sound if the switch were closed.



- (e) The diagram shows a magnet freely suspended from a wooden stand. Complete the statements below using the correct word from the list on the right in each case.



When the **north pole** of another magnet is brought **close to the north pole** of the hanging magnet they will _____ each other.

When the **south pole** of another magnet is brought **close to the north pole** of the hanging magnet they would _____ each other.

Repel
Attract

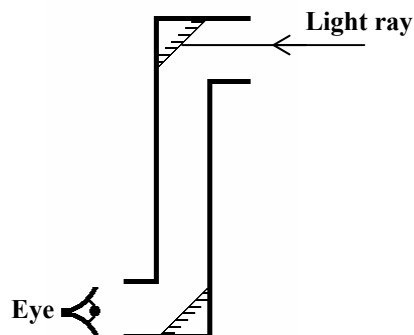
- (f) **Nuclear energy** could be used to solve Ireland's energy shortage. Give **one advantage** and **one disadvantage** of nuclear energy.

Advantage _____

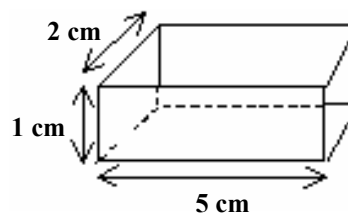
Disadvantage _____

- (g) The diagram shows a ray of light shining onto a plane mirror in a periscope.

Complete the path taken by the ray in the diagram.



- (h) A block of metal has the measurements shown on the right. The mass of the metal block is 21 g.



Write the letter **V** beside the value of of the **volume** of the block.

Write the letter **D** beside the value of of the **density** of the block.

	8 cm³
	10 cm³
	2.1 g cm⁻³
	210 g cm⁻³

(7 × 6 + 1 × 10)

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(1) (2)

Question 8

(39)

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- (a) Heat is transferred in different ways.
In each case use a word from the list on the
right to correctly complete each sentence below. (9)

Conduction
Convection
Radiation

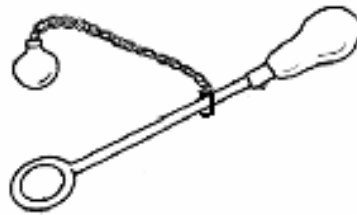
(1) (2)

Heat travels through solids by _____.

Heat travels through liquids and gases by _____.

Heat travels from the Sun to the Earth by _____.

- (b) The apparatus drawn consists of a ball
and ring.
When the ball and the ring are cold the
ball just fits through the ring.



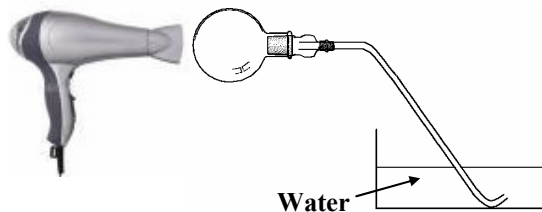
When the ball is heated the ball does not
pass through the cold ring.

What conclusion would you draw from this experiment? (6)

What would you expect to happen if the ball was cooled down again? (3)

- (c) In an investigation to see the effect heating had on gases, a student heated
a round-bottomed flask containing air using a hairdryer as shown in
the diagram.

What would you expect the
student to have seen when the
flask was heated? (6)



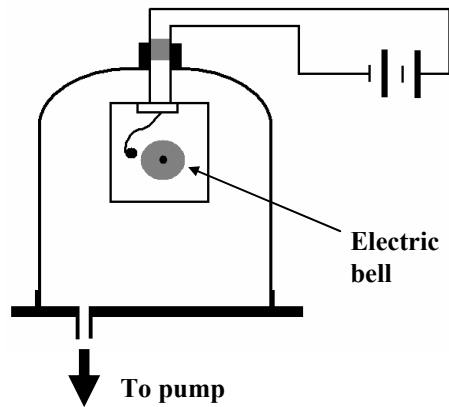
Give a **reason** for your answer. (3)

- (d) A student set up the following experiment to investigate how sound travels through air. An electric bell was placed inside a bell-jar as shown in the diagram.

The bell rang and it could be heard clearly.

When the pump was switched on it started to pump the air out of the bell-jar and a vacuum was created.

At that stage the bell could no longer be heard but it could still be seen ringing.



- (i) What conclusion could be drawn from this investigation? (6)

- (ii) When the air was pumped out, the bell could still be seen even though it could not be heard. What difference between light and sound does this show? (3)

- (iii) During an electric storm lightning is usually seen before thunder is heard.

What does this tell us about light and sound?

(3)



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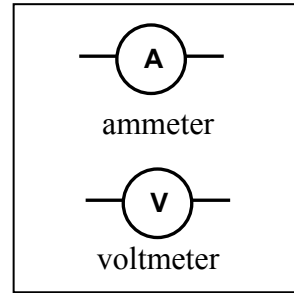
(1) (2)

Question 9

(39)

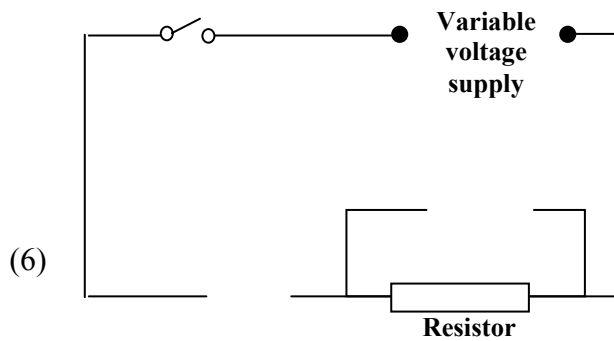
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- (a) A student set up the circuit drawn below to **investigate the relationship between the potential difference (voltage), the current and the resistance of a wire conductor.**



Gaps are left in the diagram in the places where the **ammeter** and **voltmeter** should be placed. The symbols for these devices are given on the right.

Complete the circuit **inserting the symbols** for the ammeter and the voltmeter in their **correct positions.**

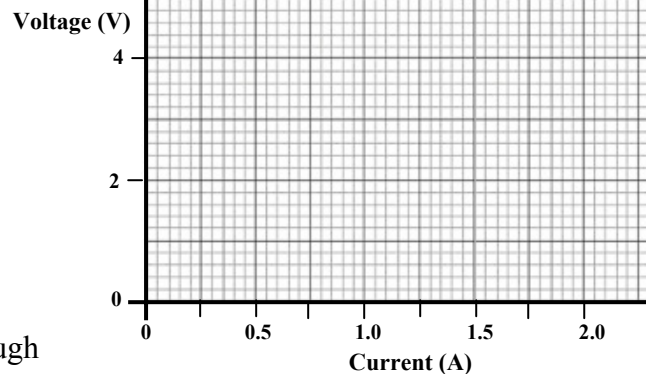


- (b) The student used the variable voltage supply to apply different voltages across the resistor. She measured the voltage across the resistor and the current passing through it several times. She collected the following data.

Voltage (V)	0	2	4	6	8
Current (A)	0	0.5	1.0	1.5	2.0

Draw a graph of the voltage (*y*-axis) against the current (*x*-axis) in the grid provided on the right.

(9)



What conclusion can you draw from the graph about the **relationship between the potential difference (voltage) and the current** passing through the wire conductor?

(3)

(1) (2)

(c) An electric cooker has four hot plates.
 The total power rating of the four hot plates is 7 kW.
 All four are used for a total of 2 hours each day.
 How many units of electricity (kWh) are used
 in 1 week? _____



If electricity costs 11 cent per unit how much does this cost?
 _____ cent

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(1) (2)

(9)

(d) Describe, with the help of a labelled diagram, how you could carry out an **experiment** to show that **light travels in straight lines**.
 Use the headings below. (12)

Equipment: _____

Procedure: _____

Result: _____

Labelled diagram

