



# Coimisiún na Scrúduithe Stáit State Examinations Commission

*Junior Certificate Examinations, Year*

## Science – Ordinary Level

### Sample Paper

DAY - DATE - TIME (2 hours)

### INSTRUCTIONS

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

<p><b>Centre Stamp</b></p> <p>_____</p>
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<p><b>Examination Number</b></p> <p>_____</p>
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<b>For examiner use only</b>	
<b>Examination paper</b>	<b>Mark</b>
Biology	
1 (52)	
2 (39)	
3 (39)	
Chemistry	
4 (52)	
5 (39)	
6 (39)	
Physics	
7 (52)	
8 (39)	
9 (39)	
<b>Coursework</b>	
Coursework A (60)	
Coursework B (150)	
<b>Total</b>	
<b>Grade</b>	

# Biology

## Question 1

(52)

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- (a) Name the piece of equipment drawn on the right.

Name \_\_\_\_\_

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

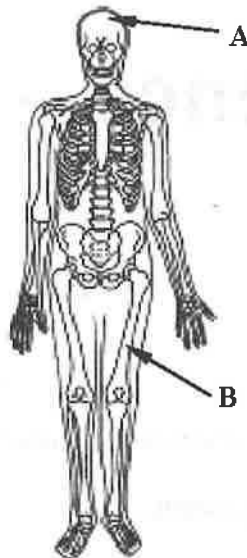
Use \_\_\_\_\_



- (b) Name the bones of the human skeleton labelled A and B in the diagram on the right.

Name A \_\_\_\_\_

Name B \_\_\_\_\_



- (c) The diagram shows the fruit and the seed of the dandelion.

How are dandelion seeds dispersed?

How? \_\_\_\_\_

Why is seed dispersal important?

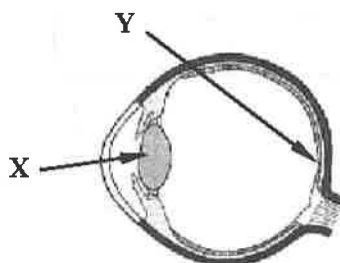
Why? \_\_\_\_\_



- (d) Name the parts of the eye labelled X and Y in the diagram.

Name of X \_\_\_\_\_

Name of Y \_\_\_\_\_

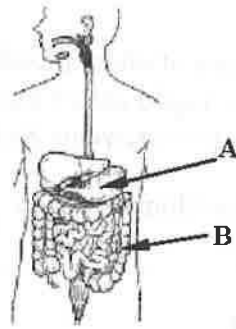


(1) (2)

- (e) Name the parts of the digestive system labelled **A** and **B** in the diagram on the right.

Name A \_\_\_\_\_

Name B \_\_\_\_\_

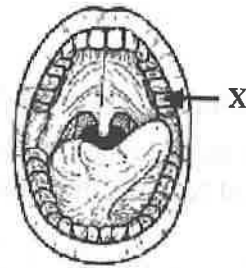


- (f) Identify the **type of tooth** labelled **X** in the diagram on the right.

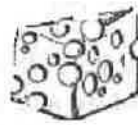
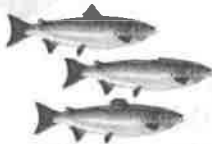
\_\_\_\_\_

What is the **main function** of this type of tooth?

\_\_\_\_\_



- (g) A menu at a restaurant offers lean meat, fish, cheese and vegetables.



Which of these foods is the best **source of carbohydrate**?

\_\_\_\_\_

What is the **main function of carbohydrate** in your diet?

\_\_\_\_\_

- (h) The seedlings in the flower pot drawn on the right were grown in a closed box which had a window to let light in at one of the points **X**, **Y** or **Z**.

Was the window at **X**, **Y** or **Z**?

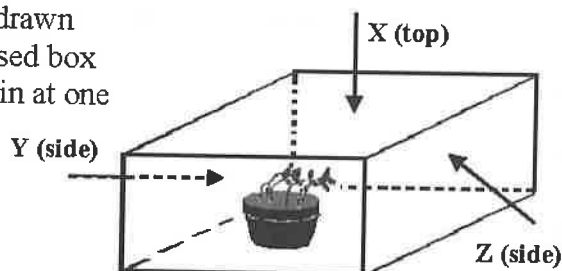
\_\_\_\_\_

Give a reason for your answer. \_\_\_\_\_

\_\_\_\_\_

Why is this growth response helpful to the plants? \_\_\_\_\_

\_\_\_\_\_



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use only

(1)

(2)

**Question 2**

(39)

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- (a) Blood consists of white blood cells, red blood cells and platelets in a liquid called plasma. Blood travels around the body in arteries, veins and capillaries.

(1) (2)

Give **two** functions of blood.

(6)

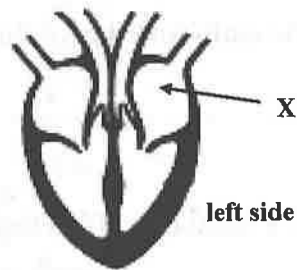
**Function 1** \_\_\_\_\_

**Function 2** \_\_\_\_\_

- (b) The heart pumps blood around the body.

- (i) **Name** the chamber of the heart labelled X in the diagram. (3)

**Name** \_\_\_\_\_



- (ii) It is important to keep your heart healthy.  
Give **one thing you should do** and **one thing you should not do** in order to keep your heart healthy. (6)

**Thing you should do** \_\_\_\_\_

\_\_\_\_\_

**Thing you should not do** \_\_\_\_\_

\_\_\_\_\_

(c) Excretion is important for the removal of cellular wastes from the body.

The urinary system has an important role in excretion from the body.

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(1) (2)

(i) Name two substances excreted from the human body. (6)

Substance 1 \_\_\_\_\_ Substance 2 \_\_\_\_\_

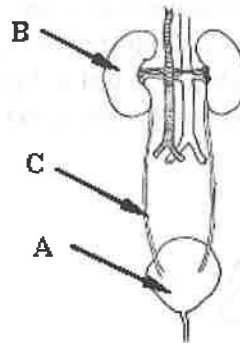
(ii) Use the names in the table on the right to identify the parts of the urinary system labelled A, B and C in the diagram below. (9)

KIDNEY
BLADDER
URETER

Name of A \_\_\_\_\_

Name of B \_\_\_\_\_

Name of C \_\_\_\_\_



(iii) Give one function of the part of the urinary system labelled A. (6)

Function of A \_\_\_\_\_

\_\_\_\_\_

(iv) Name a human organ of excretion other than an organ of the urinary system. (3)

Name \_\_\_\_\_

**Question 3**

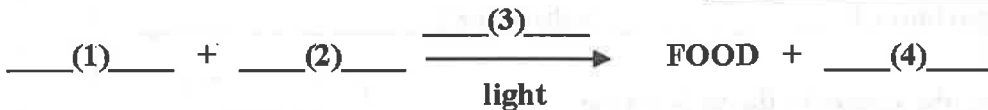
(39)

(a) Plants make their own food through photosynthesis. Match each of the four words in the table on the right with a corresponding number in the equation for photosynthesis below. (12)

CARBON DIOXIDE
OXYGEN
WATER
CHLOROPHYLL

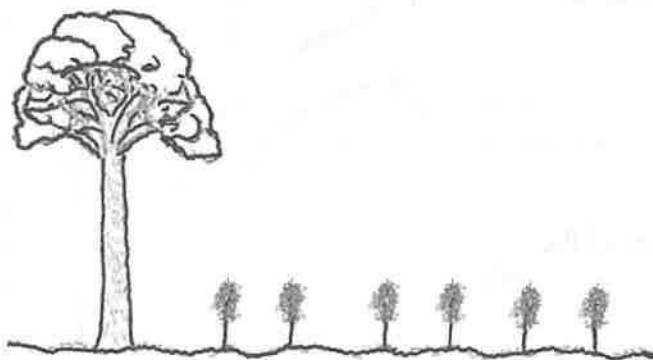
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(1) (2)

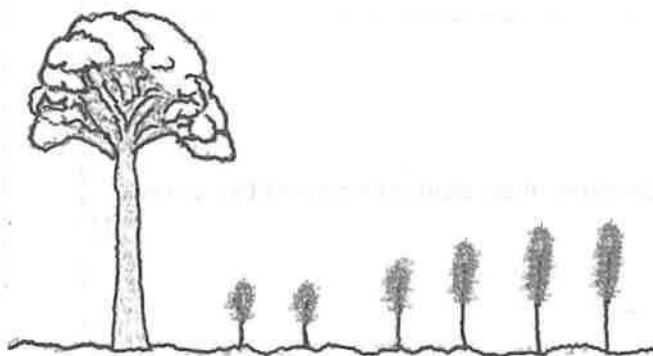


1	2	3	4

(b) A number of identical small trees were planted in the same way at different distances from a very big tree. After a few years it was noticed that the trees close to the big tree did not grow as quickly as those further away. The diagram summarises the observations made.



Trees when first planted



Trees a few years after planting

A horticultural advisor said that the poor growth of the trees closer to the big tree was due to competition.

(i) List **two** things for which the trees must compete with each other. (9)

1 \_\_\_\_\_

2 \_\_\_\_\_

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examiner  
use only

(c) (i) In ecology what is meant by *conservation*? (3)

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Certain animal and plant species are described as “threatened”.

(ii) Give an example of an Irish animal or plant species that is on the threatened list. (3)

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(iii) Many species of plant are protected in National Parks. The manager of one of these parks is asked to measure the frequency with which a protected species occurs in a habitat within the park. Describe how this might be carried out. Include a diagram of any equipment that might be used. (12)

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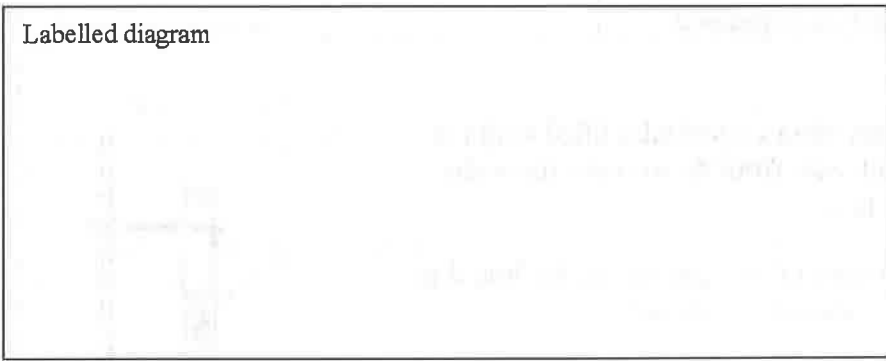
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(1) (2)

# Chemistry

## Question 4

(52)

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use only

- (a) Name the piece of equipment drawn on the right.



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

Name \_\_\_\_\_

Use \_\_\_\_\_

(1) (2)

- (b) Hydrocarbons are important fuels.

Give an **example** of a fuel that is a hydrocarbon. \_\_\_\_\_

Carbon and what **other element** are always present in hydrocarbons?

\_\_\_\_\_

- (c) In each case **choose one** state of matter from the list on the right which matches the characteristics in the table below.

Characteristics	State of matter
<ul style="list-style-type: none"> <li>▪ Has definite shape</li> <li>▪ Has definite volume</li> <li>▪ Is not easily compressed</li> </ul>	
<ul style="list-style-type: none"> <li>▪ Has no definite shape</li> <li>▪ Has no definite volume</li> <li>▪ Is easily compressed</li> </ul>	

<b>SOLID</b>
<b>LIQUID</b>
<b>GAS</b>

- (d) The diagram shows a test tube filled with ice. Water condenses from the air onto the walls of the test tube.

What **test** could you carry out on the liquid to show that the liquid is water?

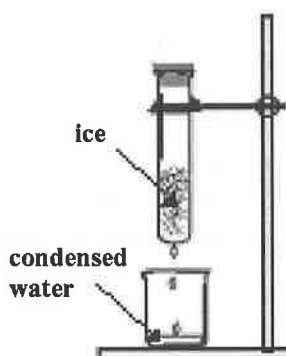
What **colour change** is observed when carrying out this test?

Test \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Colour change \_\_\_\_\_





- (e) **Complete** the statements below using one of the words from the list on the right in each case.

**Electrons** are small \_\_\_\_\_ charged particles.

**Protons** are found \_\_\_\_\_ the nucleus of an atom.

**POSITIVELY**

**NEGATIVELY**

**INSIDE**

**OUTSIDE**

For  
examiner  
use only

(1) (2)

- (f) The treatment of water for domestic use is important. There are several stages involved.

Why is **fluoride** added to domestic water supplies in Ireland? \_\_\_\_\_

How can water be treated to kill harmful bacteria? \_\_\_\_\_

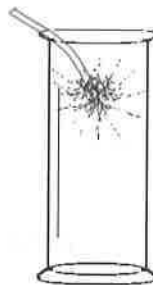
- (g) Give **one** negative impact on the environment of the use of non-biodegradable plastics for packaging.

**Negative impact** \_\_\_\_\_



- (h) A piece of magnesium burns very brightly in a gas jar of oxygen and produces a white powder.

**What is observed** when this white powder is added to water and litmus paper added?



**What** does this result tell you about the product?

Why does a piece of magnesium burn even **more brightly in oxygen** than it does in air? \_\_\_\_\_

(7 × 6 + 1 × 10)

**Question 5**

(39)

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(a) Separation techniques are very important in chemistry.

(i) What is the **name** given to the separation technique shown in diagram A? (3)

**Technique** \_\_\_\_\_

**A**



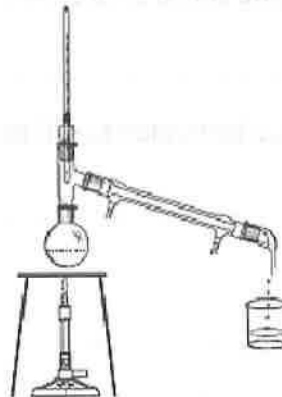
(ii) Name **two** substances which could be separated using this technique? (3)

**Substances** \_\_\_\_\_

(iii) What is the **name** given to the separation technique shown in diagram B? (3)

**Name** \_\_\_\_\_

**B**



(b) Give an example of an **alloy**. State **one** use that is made of this alloy. (6)

**Example** \_\_\_\_\_

**Use** \_\_\_\_\_

(1) | (2)

- (c) A student investigated the hardness of a number of water samples by testing them with soap flakes. In each case the same volume of water was tested. The results are given in the table.

Water sample	Number of soap flakes needed to give a lather
A	1
B	7
C	4



- (i) Which of the three water samples had the softest water? \_\_\_\_\_ (3)
- (ii) State one disadvantage of hard water \_\_\_\_\_ (3)
- (iii) State one way by which water hardness can be removed.  
\_\_\_\_\_ (3)

- (d) When hydrochloric acid reacts with zinc a colourless gas is produced.



- (i) Describe a test you could carry out on the gas to confirm that the gas is hydrogen. (9)

Test for hydrogen \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (ii) What is the name of the second product of this reaction? (3)

Name \_\_\_\_\_

- (iii) Is the pH of an acid in water higher than, lower than, or equal to 7? (3)

pH \_\_\_\_\_

For  
examiner  
use only

(1) (2)

**Question 6**

(39)

- (a) Robert Boyle introduced the word *element* into the language of chemistry.



Complete the table below identifying each of the substances listed as an element or a compound.

An example is completed in the case of carbon dioxide.

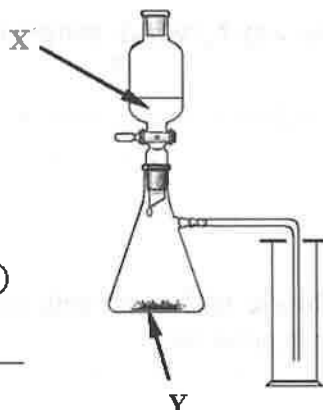
(6)

Substance	Element	Compound
Carbon dioxide		✓
Water		
Carbon		

- (b) Carbon dioxide gas can be prepared in a school laboratory using the apparatus drawn on the right.

- (i) Identify a liquid **X** and a solid **Y** that can be used in this preparation.

(12)



**Liquid X** \_\_\_\_\_

**Solid Y** \_\_\_\_\_

The diagram shows a lighting taper and a gas jar of carbon dioxide gas.

- (ii) What happens to the lighting taper when it is placed into the gas jar?

**What?** \_\_\_\_\_ (3)

- (iii) What does this tell us about carbon dioxide gas?

**What?** \_\_\_\_\_ (3)

- (iv) Name **one item** commonly found in public buildings that contains carbon dioxide and makes use of the property demonstrated in the test described above.

(3)

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(1) (2)

(c) Air is a mixture.

Describe, using a labelled diagram, how you might carry out an investigation / experiment to show that carbon dioxide is present in air. (12)

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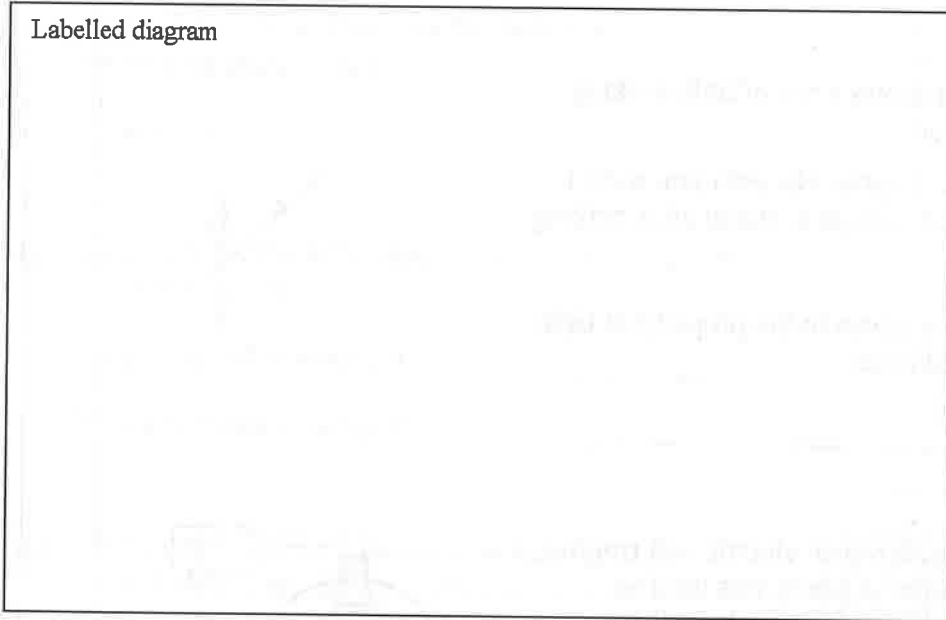
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(1) (2)

Labelled diagram



# Physics

## Question 7

(52)

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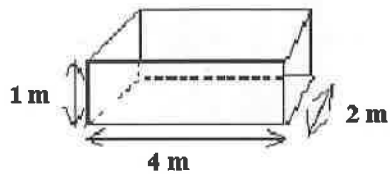
(1) (2)

- (a) Find the **volume** of the block drawn on the right using the measurements given.

Volume \_\_\_\_\_

In what **units** is the volume measured?

Units \_\_\_\_\_



- (b) Give **two** effects of a force.

Effect of a force 1 \_\_\_\_\_

\_\_\_\_\_

Effect of a force 2 \_\_\_\_\_

\_\_\_\_\_

- (c) The diagram shows a ray of light striking a plane mirror.

Draw on the diagram the path you would expect the ray of light to travel after striking the mirror.

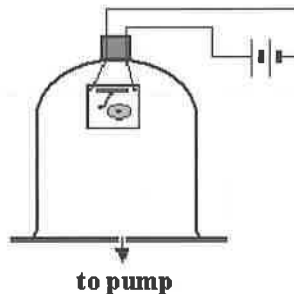


What name is given to the property of light demonstrated here?

Name \_\_\_\_\_

- (d) The diagram shows an electric bell ringing inside a bell-jar. A pump was used to remove the air from inside the bell-jar.

What **change** would you expect to notice in the sound coming from the bell when the air was removed from inside the bell-jar?



What does this experiment tell you about sound?

\_\_\_\_\_

\_\_\_\_\_

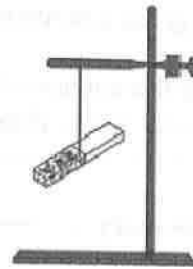
(e) The diagram shows a “freely-suspended” magnet.

What happens if the North pole of another magnet is brought close to the North pole of the hanging magnet?

What happens? \_\_\_\_\_

Give **one** use for magnets.

Use \_\_\_\_\_



(f) The piece of equipment drawn on the right is used to measure temperature.

Name this piece of equipment.

Name \_\_\_\_\_

This instrument may be used to measure the boiling point of water.

What effect has an **increase in pressure** on the boiling point of water?

Effect \_\_\_\_\_



(g) Choose from the list on the right two non-renewable sources of energy.

Non-renewable source 1 \_\_\_\_\_

Non-renewable source 2 \_\_\_\_\_

- |       |
|-------|
| COAL  |
| OIL   |
| WIND  |
| WAVE  |
| SOLAR |

(h) If you were visiting a factory and saw the **sign** shown in the diagram, what precaution should you take?

\_\_\_\_\_

What is the **scale** in which sound levels are measured?

\_\_\_\_\_



Sound levels in a house often arise from noises that come from outside the house. Mention **one** simple method of reducing the level of these noises inside the house.

\_\_\_\_\_

(7 × 6 + 1 × 10)

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use only

(1) (2)

**Question 8**

(39)

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(a) A student was given a stone and asked to measure its density.

(1) (2)

- (i) Complete the equation in the box below using two of the words on the right. (3)

Density = \_\_\_\_\_

- AREA
- MASS
- TIME
- VOLUME

- (ii) What piece of equipment could the student have used to measure the **mass** of the stone? (6)

**Piece of equipment** \_\_\_\_\_

- (iii) Describe, using a labelled diagram, how the **volume** of the stone could have been measured. (9)

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Labelled diagram

- (iv) If the mass of the stone was 36 g and its volume was 12 cm<sup>3</sup> what was the density of the stone? (6)

**Density of stone** \_\_\_\_\_



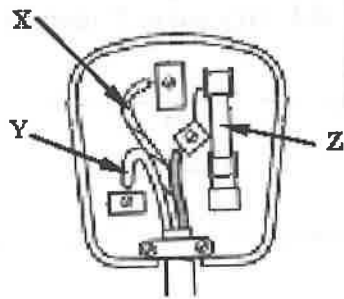


**Question 9**

(39)

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(a) The diagram shows a three-pin plug with the back removed.



(1) (2)

(i) What is the correct colour coding for the cables labelled X and Y.

Colour of X \_\_\_\_\_ (3)

Colour of Y \_\_\_\_\_ (3)

(ii) What is the function of the part labelled Z? (3)

Function of Z \_\_\_\_\_  
\_\_\_\_\_

(b) The ESB charges for electricity at a cost of 10 cent per kWh.

An electric kettle has a power rating of 2 kW.



How many units of electricity (kWh) are used when the kettle is switched on for a total 30 minutes during a day?

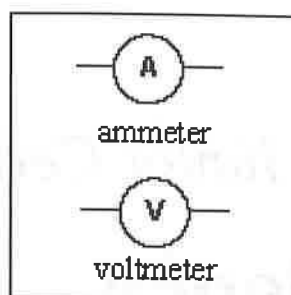
Number of units (kWh) \_\_\_\_\_ (3)

What is the cost in cent of using the kettle for an average of 30 minutes each day for one week? (6)

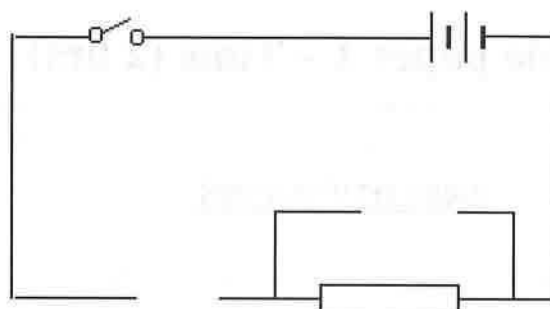
Cost \_\_\_\_\_ cent

For  
examiner  
use only

- (c) (i) Complete the circuit below inserting the symbols on the right to show where the ammeter and the voltmeter should be connected in the circuit in order to measure the current passing through the resistor and the potential difference (voltage) across it. (6)



(1) (2)



- (ii) Write the letter **S** beside the switch in the circuit diagram. (3)

- (iii) What is the relationship between the current passing through a resistor and the potential difference (voltage) across it. (6)

\_\_\_\_\_

- (d) The diagram shows a car.

In dry weather you can sometimes get an electric shock when you get out of (or touch) a car.



What name is given to the type of electricity which gives rise to this problem? (3)

Type of electricity \_\_\_\_\_

How can this problem be prevented? (3)

How? \_\_\_\_\_

\_\_\_\_\_