



Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2008

SCIENCE (REVISED SYLLABUS) – ORDINARY LEVEL

THURSDAY, 12 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, an extra page is 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)	

Biology

Question 1

(52)

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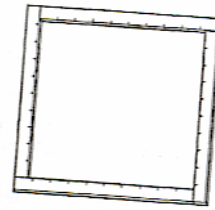
- (a) The piece of equipment drawn on the right is used in ecology.

Name the piece of equipment.

Name _____

Give one use for this piece of equipment.

Use _____

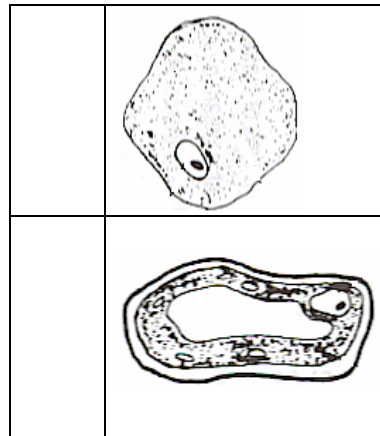


(1) | (2)

- (b) The diagram shows an animal cell and a plant cell.

Write the letter **P** beside the plant cell in the table on the right.

Write the letter **A** beside the animal cell in the table on the right.



- (c) Write the letter **T** opposite the name of a body **tissue** in the table on the right.

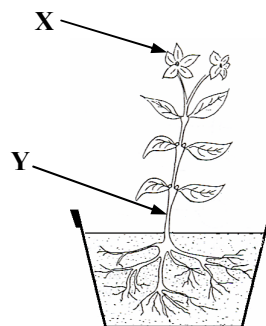
Write the letter **O** beside the name of a body **organ** in the table on the right.

	Muscle
	Digestive system
	Heart

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

Name of **X** _____



Name of **Y** _____



(e) Seeds are dispersed in different ways.

In the table on the right write the letter **W** under the seed that is dispersed by **wind**.

Write the letter **A** under the fruit whose seeds are dispersed by **animals**.

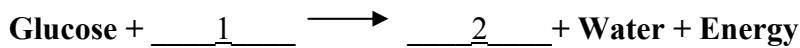
strawberry	dandelion
	

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(1) (2)

(f) From the list on the right identify the correct word(s) needed to replace each of the numbers 1 and 2 in the equation below so that the equation describes respiration.

Oxygen
Carbon Dioxide



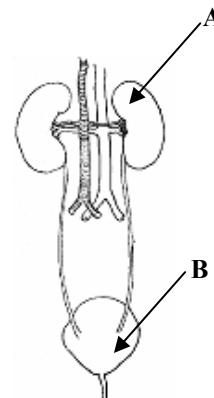
1 _____ 2 _____

(g) The diagram shows the human urinary system.

Name the part labelled **A** in the diagram.

A _____

What is the **function** of the part labelled **B** in the diagram? _____

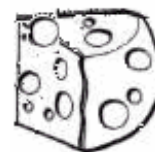


(h) The table shows the nutritional information given on the labels on two foods **A** and **B**.

Nutritional information	Food A per 100 g	Food B per 100 g
Energy	1629 kJ	394 kJ
Protein	26 g	5.6 g
Carbohydrate	Trace	20.3 g
Fat	19.5 g	0.6 g

Which food, **A** or **B**, provides the most energy per 100 g?

Which food, **A** or **B**, is **more likely to be cheese**? _____



Give a reason for your answer. _____

(7 × 6 + 1 × 10)

Question 2

(39)

(a) One of the functions of the skeleton is to protect the body. (12)

(i) In the table write the letter **P** beside the organ which is protected by the pelvis.

(ii) In the table write the letter **S** beside the organ which is protected by the skull.

	Lungs
	Brain
	Kidney

(iii) In the table write the letter **R** beside the organ which is protected by the ribs.

(iv) Give **one** other function of the skeleton, other than protection.

(b) The diagram shows the human eye. Examine the diagram and answer the questions that follow. (15)

	Iris	
	Retina	
	Lens	
	Allows light in	
	Focuses light	

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

(ii) In the table write the letter **B** beside the **name** of the **part** labelled **B**.

(iii) In the table write the letter **C** beside the **function** of the **part** labelled **A**.

(iv) In the table write the letter **D** beside the **function** of the **pupil**.

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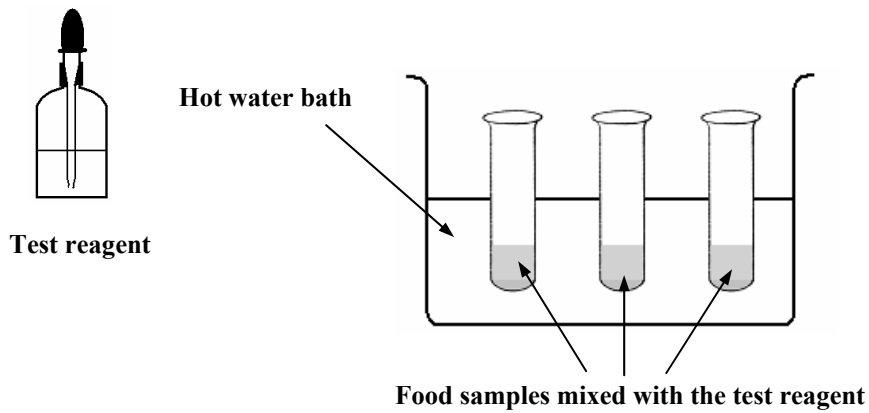
(1) (2)

- (c) In an investigation to test for the presence of a reducing sugar, a student set up the apparatus drawn below. Study the diagram and answer the questions that follow.

(12)

(1)

(2)



- (i) In the table write the letter **S** beside the name of the **solution** used to test (the test reagent) for the presence of a reducing sugar.

	Biuret
	Benedict's
	Fehling's

- (ii) In the table write the letter **R** beside the name of a **reducing sugar**.

	Glucose
	Sucrose

- (iii) In the table write the letter **B** beside the **colour** of the test solution used at the **beginning** of the experiment.

	Brown
	Blue
	Brick Red

In the table write the letter **E** beside the **colour** of the test solution that indicates a **positive result** for the presence of a reducing sugar.

Question 3

(39)

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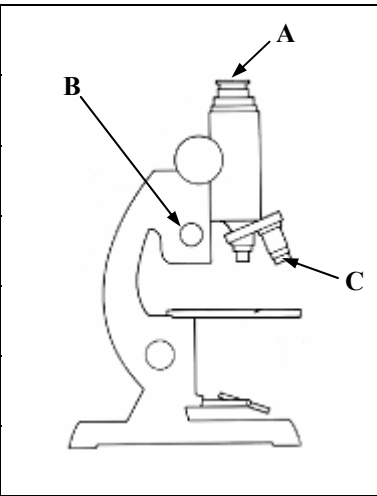
(a) The diagram shows a microscope.

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

(12)

(1)

(2)

	Lens	
	Lamp	
	Eye piece	
	Focus wheel	
	Base	
	To focus	
	To magnify	

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

(ii) In the table write the letter **B** beside the **name** of the **part** labelled **B**.

(iii) In the table write the letter **C** beside the **name** of the **part** labelled **C**.





(iv) In the table write the letter **F** beside the **function** of the **part** labelled **B**.

(b) The diagram below shows a simple key used to identify some common organisms found in a habitat.

Letter	Key feature of organism
A	Four pairs of legs
B	Segmented body, no legs
C	Three pairs of legs
D	Eight to ten pairs of legs

In the case of **any two** of the organisms shown on the right, write the **letter** corresponding to a **key feature** given in the table above beside the organism which that key feature best describes.

(9)

	 spider
	 wasp
	 robin
	 caterpillar

(c) Plants make their own food using sunlight.
Choose a word from the list on the right that correctly completes each of the statements below. (6)

- Root
- Leaf
- Iodine
- Litmus

For examiner use only	
(1)	(2)

The **part** of a plant where most food is made is the _____ .

The **chemical** used to test if a plant has made food (starch) is _____ .

(d) Describe, with the help of a labelled diagram, how you would show the **path of water** upwards through a **plant or a part of a plant**. (12)

Use the headings below.

Equipment: _____

Procedure: _____

Result: _____

Labelled diagram

Chemistry

Question 4

(52)

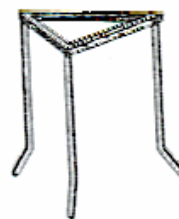
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- (a) Name the piece of equipment drawn on the right.

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

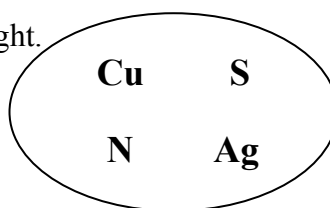
Name _____

Use _____



(1) (2)

- (b) Solids can be metals or non-metals. Identify **two non-metals** from the elements whose symbols are shown on the right.



1 _____

2 _____

- (c) Metals have certain characteristics.

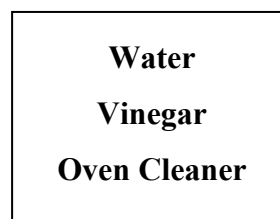
In the table, write **M** beside each of **two** characteristics of metals.

	Dull
	Can be stretched
	Shiny

- (d) Choose an example of a household **acid** and a household **base** from the list on the right.

Acid _____

Base _____



- (e) The diagram shows a piece of magnesium being burned in air. Magnesium oxide is formed.

When magnesium oxide is tested with moist red litmus indicator it changes colour to blue.

What does this tell us about magnesium oxide?

(f) **Water** supplied to domestic consumers is treated.

In the table write the letter **R** beside the name of the treatment used to **remove large floating debris** from the water.

In the table write the letter **T** beside the treatment used to help **prevent tooth decay**.

	Chlorination
	Fluoridation
	Settling
	Screening

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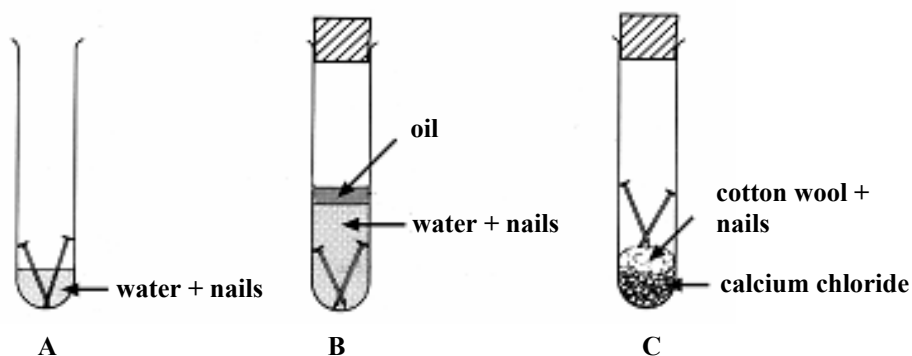
(1) (2)

(g) Oxygen gas is one of the gases found in clean air. Name any **two** other gases normally found in clean air.

1 _____ 2 _____

(h) The diagram shows an apparatus set up by a student to investigate the rusting of iron nails.

Study the diagram and answer the questions that follow.



Why did the nails in test tube **A** rust?

Why did the nails in **B** not rust?

Name one method that can be used to prevent the rusting of iron.

(7 × 6 + 1 × 10)

Question 5

(39)

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(a) Atoms are composed of smaller particles.
Choose the correct particle
from the list on the right to complete
each statement below. (12)

Proton
Neutron
Electron

(1) (2)

- (i) The _____ is a particle that has no electric charge.
- (ii) The _____ is a particle that has a positive charge.
- (iii) The _____ is a particle located outside the nucleus.
- (iv) The _____ is a particle that has a relative atomic mass of one unit.

(b) The diagram shows an apparatus set up to investigate water hardness.

One test tube has hard water while the other has soft water.



Study the diagram and answer the questions which follow. (15)

(i) Why is it necessary to use the same amount of water in each test tube and to add the same volume of soap solution to each test tube?

(ii) When both tubes were shaken a lather formed in test tube **A** but not in test tube **B**.

What does this tell you about the water in test tube **A**?

(iii) Name an element whose compounds contribute to hardness in water.

(c) When hydrochloric acid reacts with sodium hydroxide to neutralise each other, a salt and water are formed. Some of the pieces of equipment used in this experiment are shown in the diagram.

(i) **Name** the piece of equipment labelled **A**. (3)

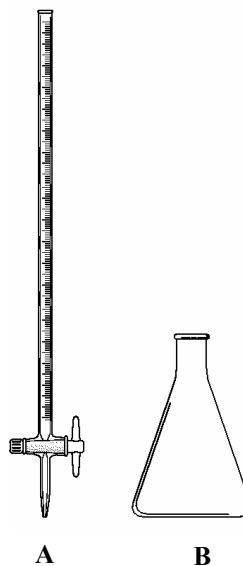
Name _____

(ii) Name the **salt** formed when sodium hydroxide is neutralised by hydrochloric acid. (3)

Name _____

(iii) Which piece of equipment **A** or **B** is usually used to measure the hydrochloric acid during this experiment? (3)

(iv) How can you tell by using an indicator that enough hydrochloric acid has been added to neutralise the sodium hydroxide? (3)



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(1) | (2)

Question 6

(39)

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(a) Choose **two fossil fuels** from the list on the right. (6)

- COAL
- NUCLEAR
- OIL
- TIDAL

(1) (2)

1 _____ 2 _____

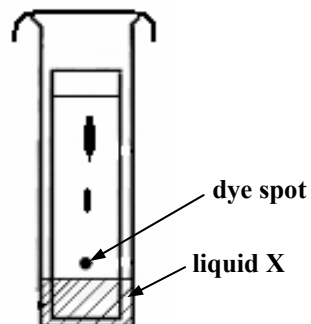
Name **two products** formed when a fossil fuel is burned in air.

(6)

1 _____ 2 _____

(b) A solution of dye can be separated into its constituent colours using the method shown in the diagram. (9)

Identify a liquid **X** that can be used in this separation.



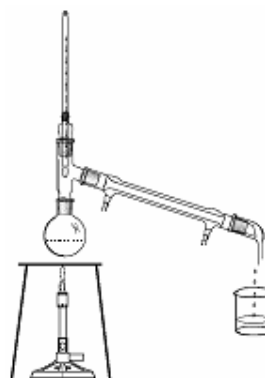
Liquid X _____

What **name** is given to this type of separation?

(c) Separation techniques are very important in chemistry. (6)

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

Technique _____



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

Substances _____

(d) Describe, with the aid of a labelled diagram, how you could carry out an experiment to **separate soil from a mixture of soil and water**.
Use the headings below.

(12)

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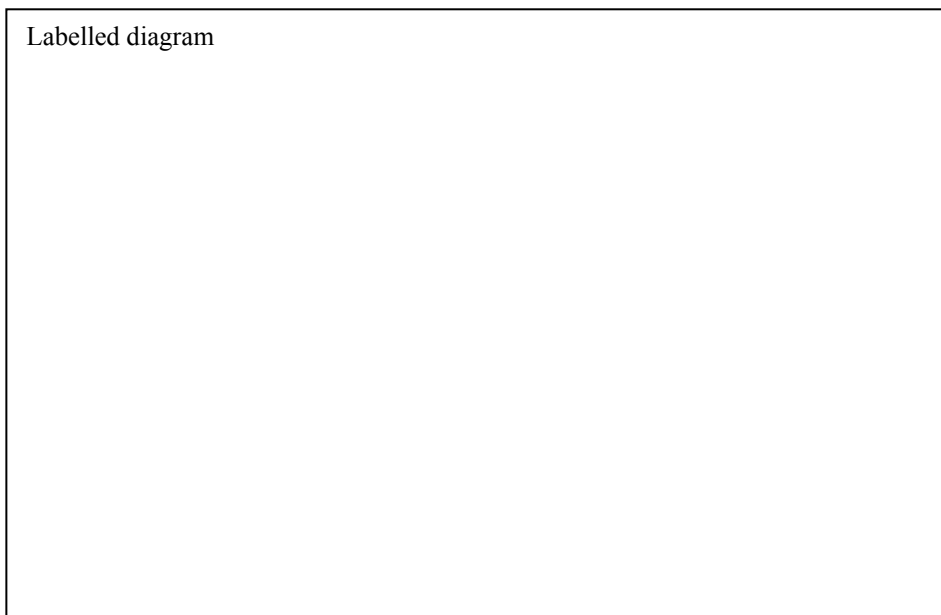
(1) (2)

Equipment: _____

Procedure: _____

Result: _____

Labelled diagram



Physics

Question 7

(52)

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- (a) Name and give one use for the piece of equipment shown in the diagram.

Name _____

Use _____



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

Complete the path taken by the ray in the diagram.

Name the property of light shown.



- (c) In the table write the letter **R** beside **two** forms of **renewable** energy.

	OIL
	WIND
	SOLAR
	COAL
	WAVE

- (d) **Complete** the equation in the box below using the words on the right.

Density = _____

MASS

VOLUME

If the mass of a stone is 20 g and the volume of the stone is 10 cm³, find the density of the stone.

Density = _____ g / cm³

(1) | (2)

(e) Write the letter **C** beside the unit of electric current.

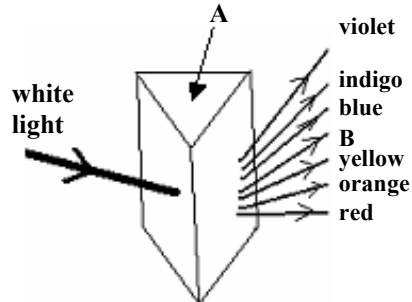
Write the letter **E** beside the unit of electricity used by the ESB for costing.

	Volt
	Ampere
	Kilowatt hour

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(1) (2)

(f) The equipment shown in the diagram was set up and used in an experiment on light.



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

Name the colour labelled **B**.

(g) The picture shows a flash of lightning.

Which is detected first, the flash of lightning or the clap of thunder?

What does this tell us about the speed of light?



(h) The diagram shows a round-bottomed flask full of coloured water.

What would you expect to notice if the flask is heated gently? _____

Give a reason why this should happen.

Why is coloured water used during this investigation?



(7 × 6 + 1 × 10)

Question 8

(39)

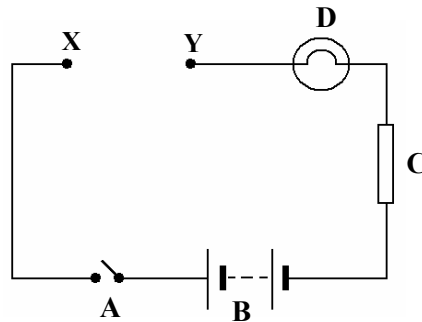
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(a) The diagram shows a simple electrical circuit.

(1) (2)

(i) **Complete** the table below correctly matching each of the names of the components in the circuit with one of the labels **A, B, C** or **D**. (12)

Label	Circuit component
	BULB
	POWER SUPPLY
	RESISTOR
	SWITCH



(ii) You are given a piece of copper metal and a piece of timber. (6)

Which piece, **metal** or **wood**, should you connect between **X** and **Y** in order that the bulb would light when the switch is closed?

Give a reason for your choice.

Reason _____

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

Answer the questions below using the table. (9)

(9)

(i) In the table below write the letter **X** opposite the name of the green and yellow wire.

(ii) Write the letter **Y** opposite the name of the wire to which the fuse is connected.

(iii) Write the letter **Z** opposite the function of the fuse in a plug.

	Live	
	Neutral	
	Earth	
	Insulation	
	Safety	

(c) Describe, with the help of a labelled diagram, how you could carry out an experiment to **plot the magnetic field of a bar magnet**.

Use the headings below.

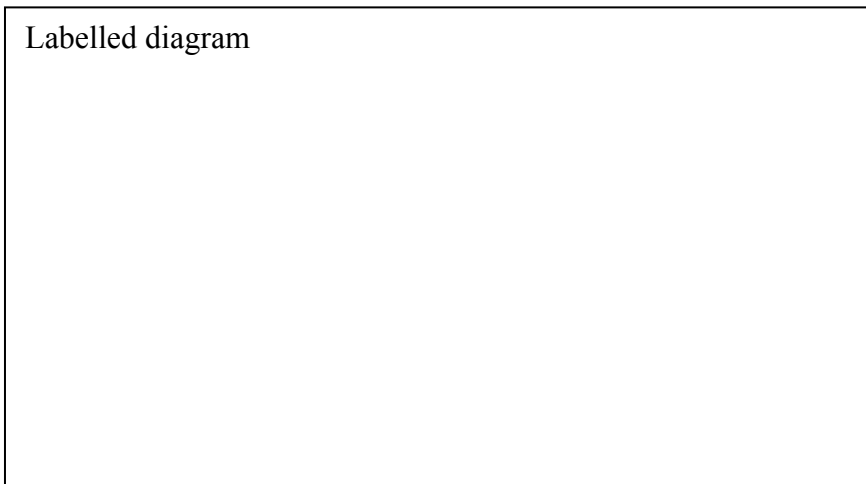
(12)

Equipment: _____

Procedure: _____

Result: _____

Labelled diagram



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(1)

(2)

Question 9

(39)

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(a) The diagram shows a common light bulb.

Complete the table below by writing the letter **B** beside the two main energy changes that take place when the bulb is in use.

(6)



bulb

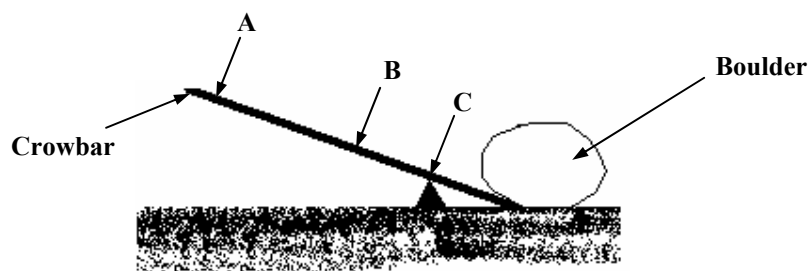
	Electrical to light
	Electrical to sound
	Electrical to heat
	Chemical to heat
	Heat to light

(1) (2)

(b) The crowbar in the diagram acts as a lever and applies a turning force on the boulder (large rock).

Answer the questions which follow with reference to the points **A**, **B** and **C** in the diagram.

(12)



(i) Which of the three points, **A**, **B** or **C**, is the fulcrum (the point about which the turning force acts)? _____

(ii) At which of the three points, **A**, **B** or **C**, will the least force be needed to move the boulder? _____

Give a reason for your answer.

- (c) A cyclist moved along a track.
 The distance travelled by the cyclist
 was measured every 2 seconds.
 The data collected is presented in the table below.

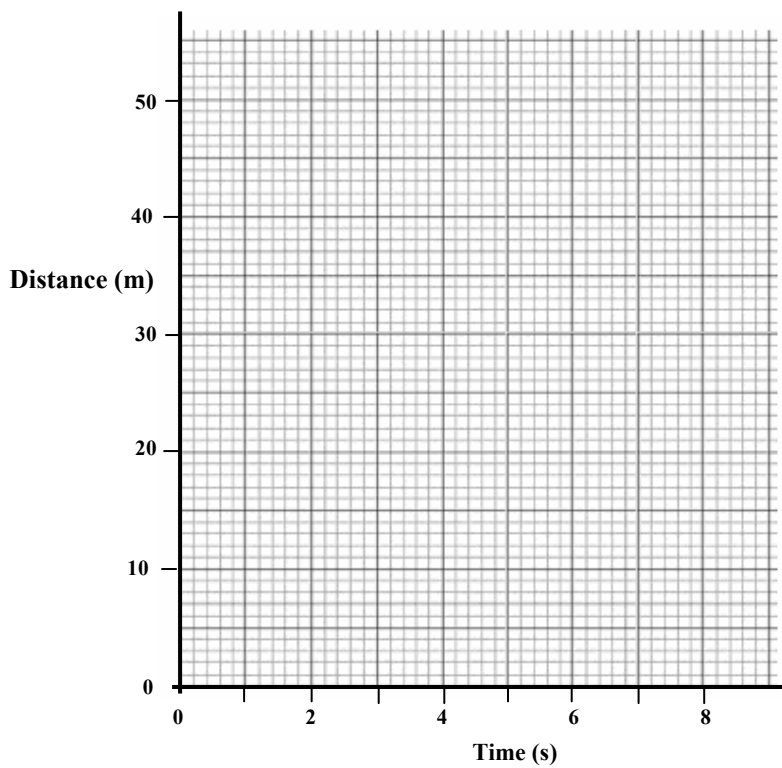


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(1) | (2)

<u>Distance travelled</u> m	0	10	20	30	40
<u>Time</u> s	0	2	4	6	8

- (i) Use this data to draw a graph of distance travelled (*y*-axis) against time (*x*-axis) using the grid provided below. (12)



- (ii) Use the graph to estimate the distance travelled by the cyclist in 5 seconds. (6)

- (iii) Calculate the speed of the cyclist in m s^{-1} (m / s). (3)
