Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2025

Double Award Science: Physics

Unit P2

Higher Tier

[GDW62]

GDW62

MONDAY 16 JUNE, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete questions in black ink and use a dark HB pencil for drawings and graphs.
Do not write with a gel pen.
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You may use a scientific calculator.
Quality of written communication will be assessed in Question **1**.

14722

24GDW6201

1 This question is about stars.

In this question you will be assessed on the quality of your written communication skills, including the use of specialist scientific terms.

Your answer should include the following:

- the materials used to form a star;

_____

_____

_____

- the force involved and how this force helps form the star;

_____

_____

_____

- the name of the nuclear reaction that occurs;

_____

_____

- how scientists know that helium is present in stars.

_____

_____ [6]

2 There are eight planets in our Solar System as shown in the diagram below.

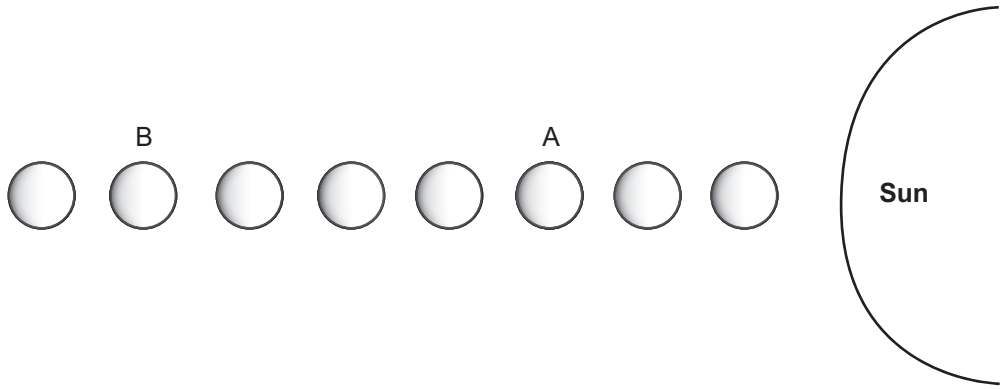

Diagram not to scale

Source: Principal Examiner

(a) What is the name of planet A?

_____

What is the name of planet B?

_____

On the diagram, put a circle around all of the gas planets.

What is the name of the rocky planet furthest from the Sun?

_____ [4]

(b) Give the names of **two** objects, other than planets, that orbit the Sun.

_____

_____

Name the force that keeps the objects in orbit.

_____ [3]

[Turn over

3 A boy plays video games for 10 minutes.

Source: © Getty Images

(a) (i) The power rating on the gaming console is 152 W.

Calculate the amount of energy used by the gaming console in the 10 minutes.

Show your working out.

Energy = _____ J [4]

(ii) The power rating of the screen is 184 W and it is connected to a 230 V mains supply.

Calculate the current flowing to the screen.

Show your working out.

Current = _____ A [3]

(iii) Calculate the voltage across the gaming controller if it has a resistance of 30 Ω and a current of 100 mA flows through it.

Show your working out.

Voltage = _____ V [4]

[Turn over

Some appliances in the home use direct current (d.c.) and some use alternating current (a.c.).

(b) (i) Explain what is meant by:

Direct current _____

_____

Alternating current _____

_____

_____ [3]

A direct current can be shown on a cathode ray oscilloscope (CRO).

(ii) Sketch what you would see if you connected a CRO to a direct current supply.

[1]

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(Questions continue overleaf)

4 The magnetic field lines around a bar magnet can be traced out in a science laboratory.

(a) What piece of equipment would you need to find the position and direction of the field lines?

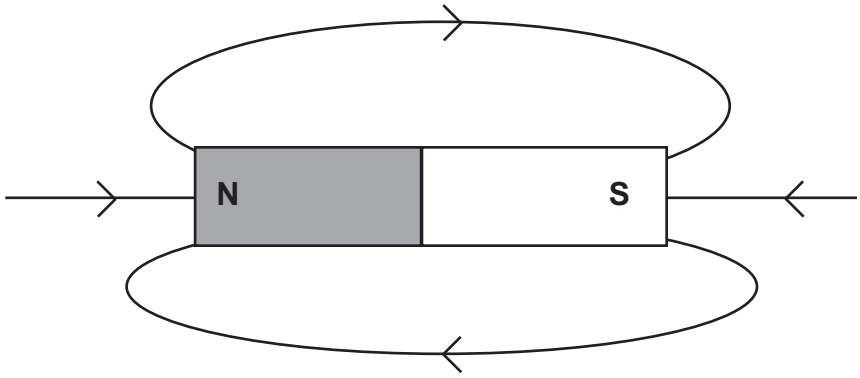
_____

Three students have drawn the magnetic field around a bar magnet as shown.

Place a tick (✓) in the box beside the diagram of the student who has drawn the magnet and field lines correctly.

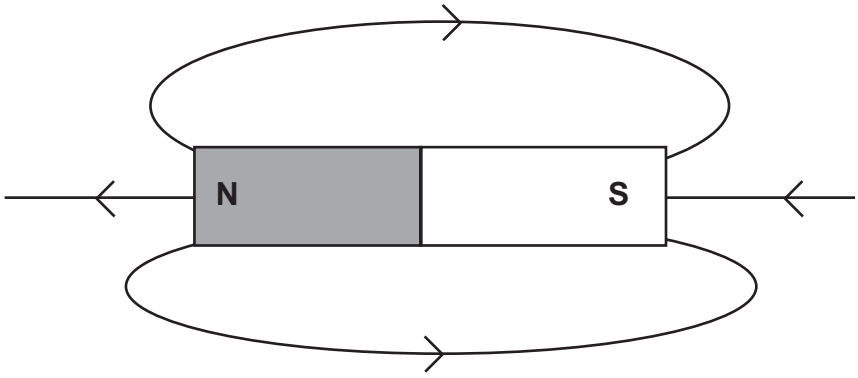
Student A

☐



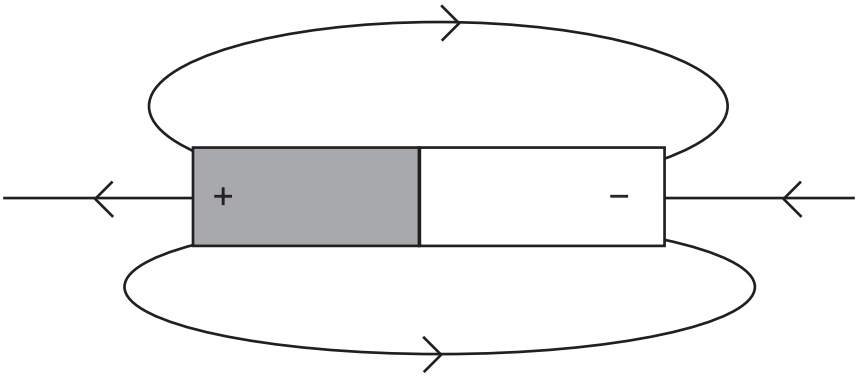
Student B

☐



Student C

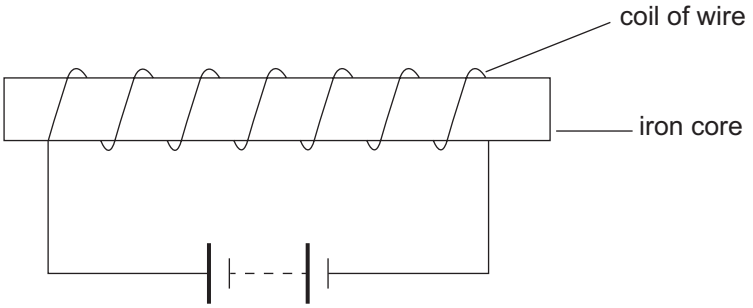
☐



Source: Principal Examiner

[2]

The students then made an electromagnet using a coil of wire, an iron core and a battery.



(b) State three ways to **decrease** the strength of the electromagnet.

1. _____

2. _____

3. _____ [3]

5 Dogs are trained using whistles that produce ultrasound.

Source: © Getty Images

(a) (i) What is ultrasound?

_____

_____ [1]

(ii) A dog whistle has a frequency of 33 kHz and the speed of sound in air is 330 m/s.

Calculate the wavelength of the sound from the dog whistle.

Show your working out.

Wavelength = _____ m [4]

A water wave is an example of a transverse wave.

(b) Describe the motion of the particles in a transverse wave.

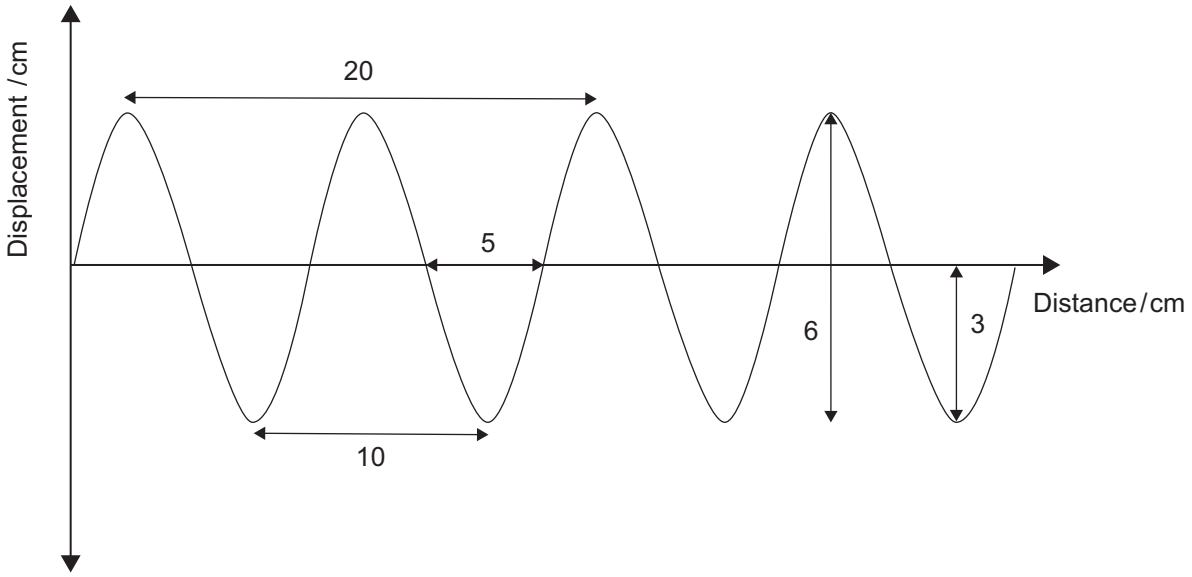
_____

_____

_____ [3]

(c) The graph below shows information about a wave.

Use the information on the graph to state the amplitude and wavelength of the wave.



Amplitude = _____ cm

Wavelength = _____ cm [2]

[Turn over

Source: © Getty Images

(d) Every minute, 30 water waves hit a pier.

Calculate the frequency of the water waves.

Show your working out.

Frequency of the waves = _____ Hz [3]

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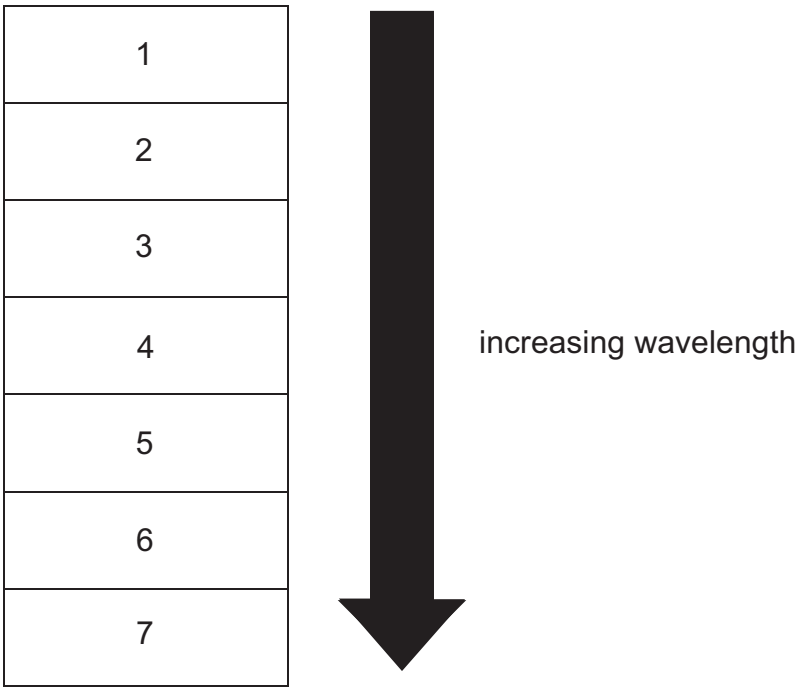
(Questions continue overleaf)

6 A student lists the regions of the electromagnetic spectrum. They are arranged in order of increasing wavelength.



(i) Which electromagnetic waves would be in boxes 2, 3 and 7?

2: _____

3: _____

7: _____ [3]

Overexposure to different regions of the electromagnetic spectrum can be dangerous to the human body in different ways.

(ii) Complete the sentences below by inserting the **main** danger to the human body of overexposure to each electromagnetic wave.

Gamma rays can be dangerous because

_____

Microwaves can be dangerous because

_____

Infrared can be dangerous because

_____

Intense visible light can be dangerous because

_____ [4]

7 The focal length of a converging lens can be measured using a distant object and a screen.

The instructions below explain how to find the focal length in a science laboratory, but they are not in the correct order. Steps **1**, **2** and **6** have been completed for you.

(a) Put the number **3**, **4** or **5** in each box to show **the order** in which the steps should be carried out.

2	Place an illuminated object more than 10 metres from the lens.
	Measure the distance from the centre of the lens to the screen.
1	Start with the lens close to the screen.
	Stop moving the lens when a clear image is formed.
	Move the lens away from the screen slowly.
6	Record the focal length.

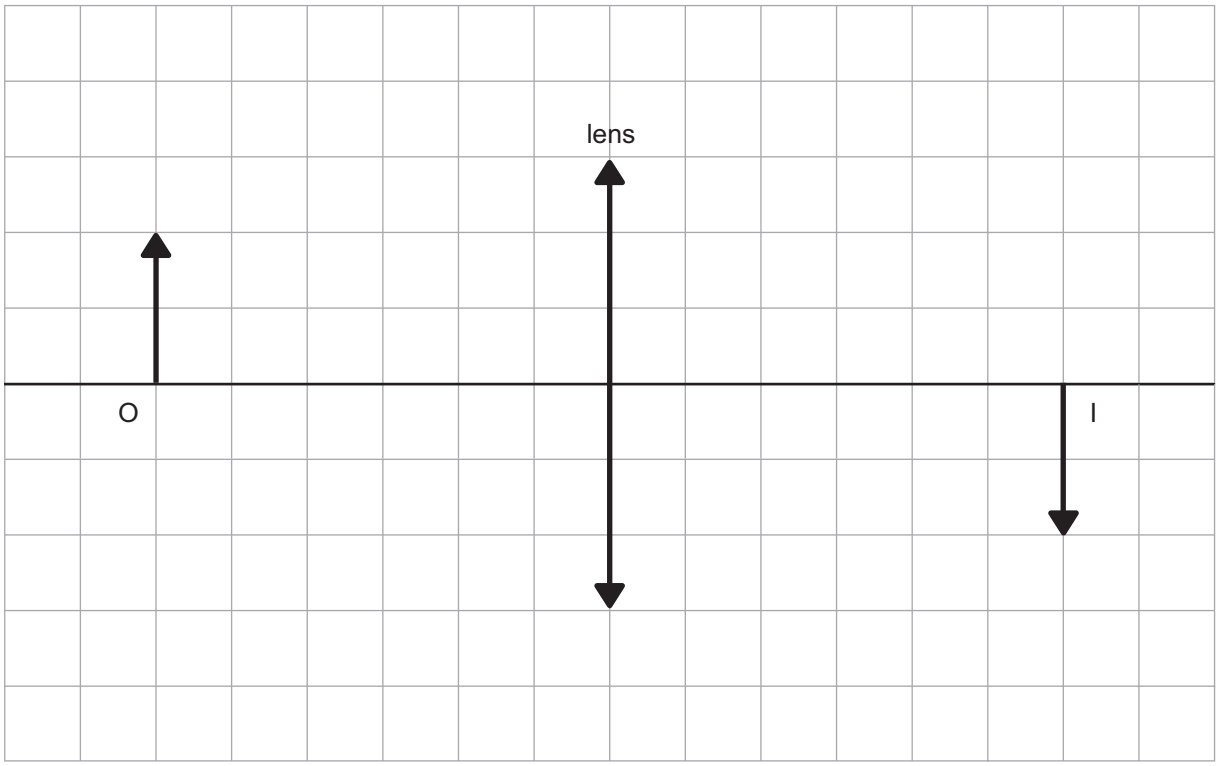
[2]

(b) (i) The diagram below shows an object O placed 6 cm from a lens with an unknown focal length. The image formed by the lens has been labelled I.

Complete the diagram below to show how the image of O was formed.

Include the following:

- **two rays** from the top of the object;
- arrows to show the directions of the rays; and
- an **F** to label the focal point (principal focus) of the lens.



If each square in the diagram is 1 cm wide, what is the focal length of the lens?

Focal length = _____ cm [5]

(ii) The image **shown** is inverted and is the same size as the object.

Name one other property of the focused image.

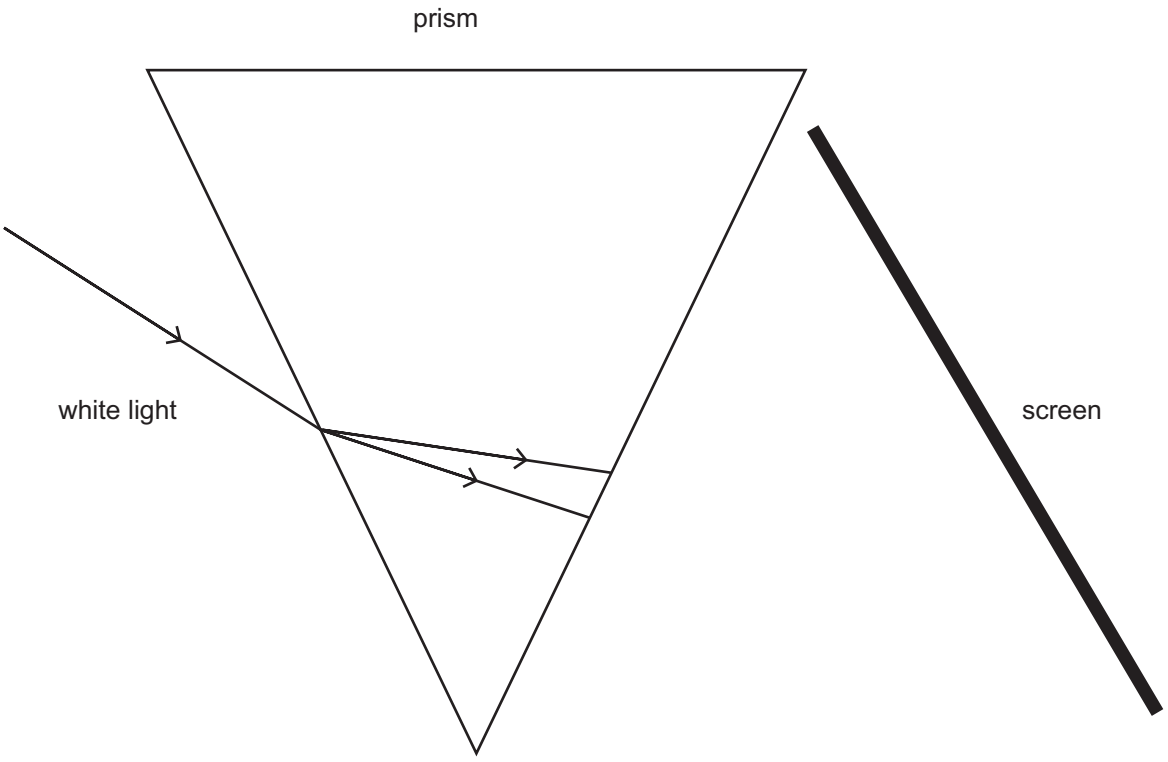
_____ [1]

[Turn over

8 Dispersion occurs when white light passes through a glass prism.

(a) On the diagram:

- draw a normal where the white light enters the glass prism; and
- continue the path of the two rays until they reach the screen. [3]



Source: Principal Examiner

The range of colours produced is called a spectrum.

(b) Which colour is in the middle of the spectrum?

_____

Which colour would appear at the top of the screen in the diagram you have completed?

_____

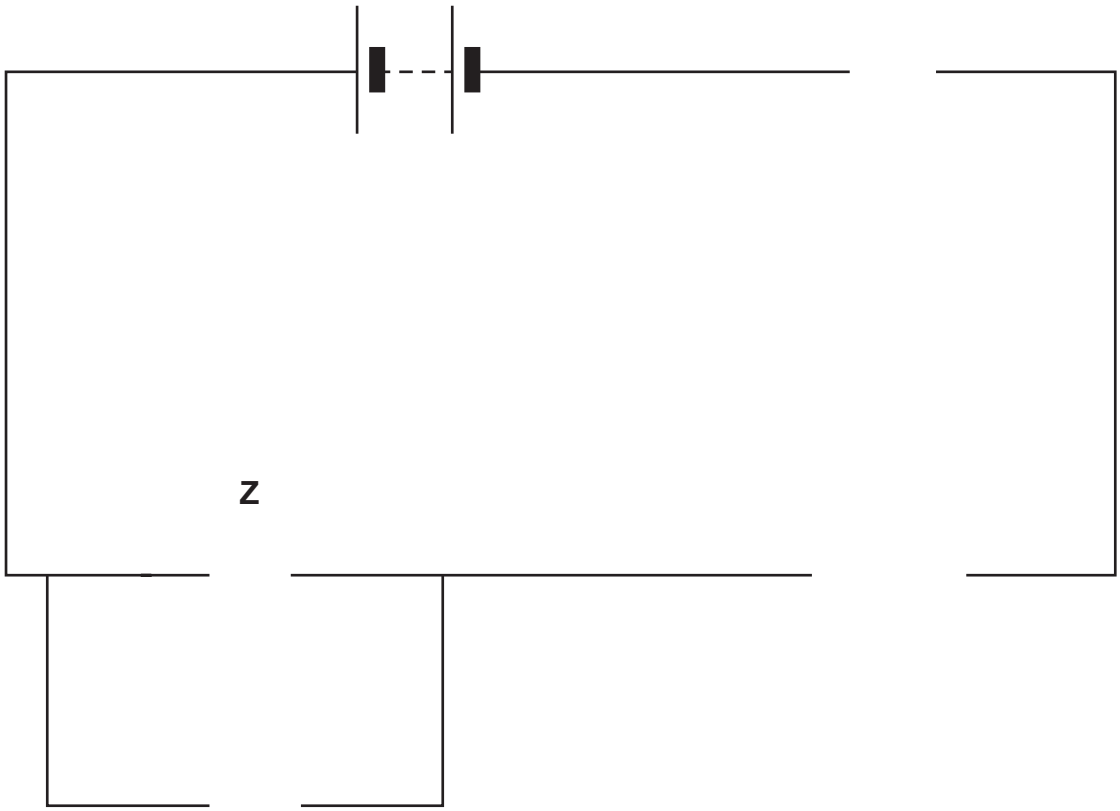
Explain, in terms of speed, why dispersion occurs when white light enters a glass prism.

_____

_____ [3]

9 A student carries out an investigation to obtain the voltage–current characteristic graph for a filament lamp.

The incomplete circuit she used is shown below.



(a) In the gap **Z**, insert the symbol for the filament lamp.

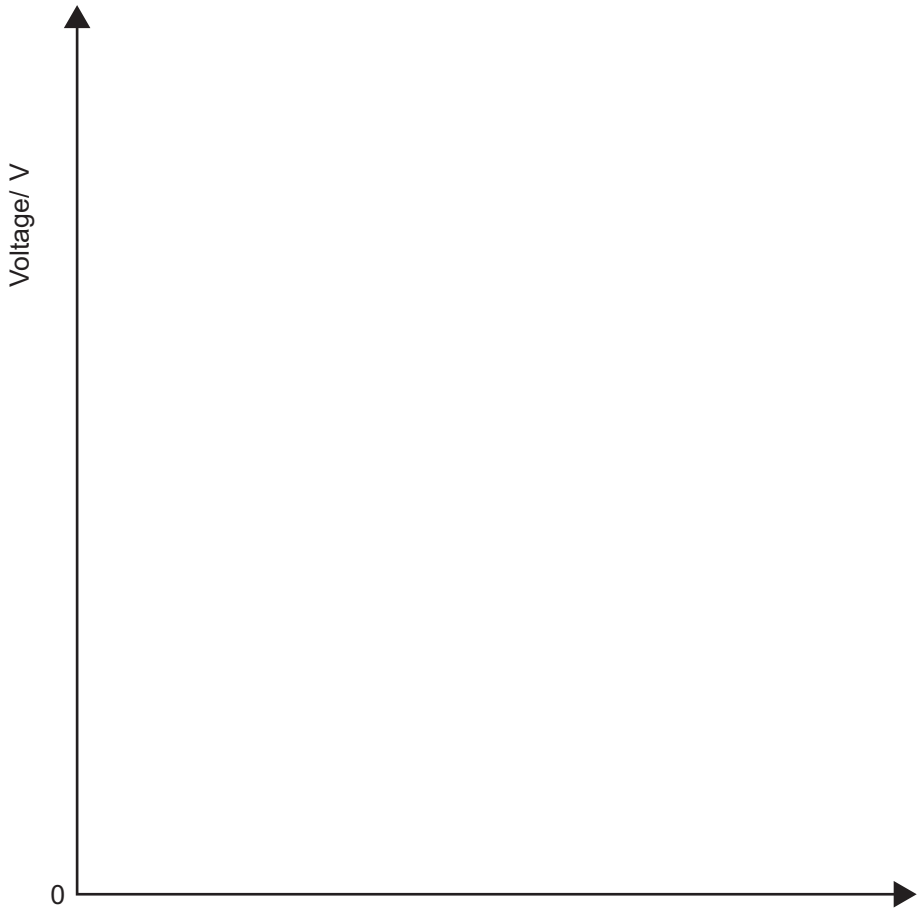
In the remaining gaps, insert the symbols for the three components that are needed to get a range of readings. [4]

[Turn over

When the student completed the experiment, she plotted a voltage–current characteristic graph for a filament lamp.

(b) Complete the graph below by:

- labelling the x-axis with the correct quantity and unit; and
- sketching the graph the student would have obtained.



[4]

(c) As the current is increased through the filament lamp, the resistance changes.

In what way does the resistance change?

_____

Explain fully what changes occur, in the wire within the lamp, as the current increases.

_____

_____

_____

_____

_____ [5]

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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

Examiner Number

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