Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2023

Double Award Science: Physics

Unit P2

Foundation Tier

[GDW61]

GDW61

FRIDAY 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 in black ink only. **Do not write with a gel pen.**
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **7**.

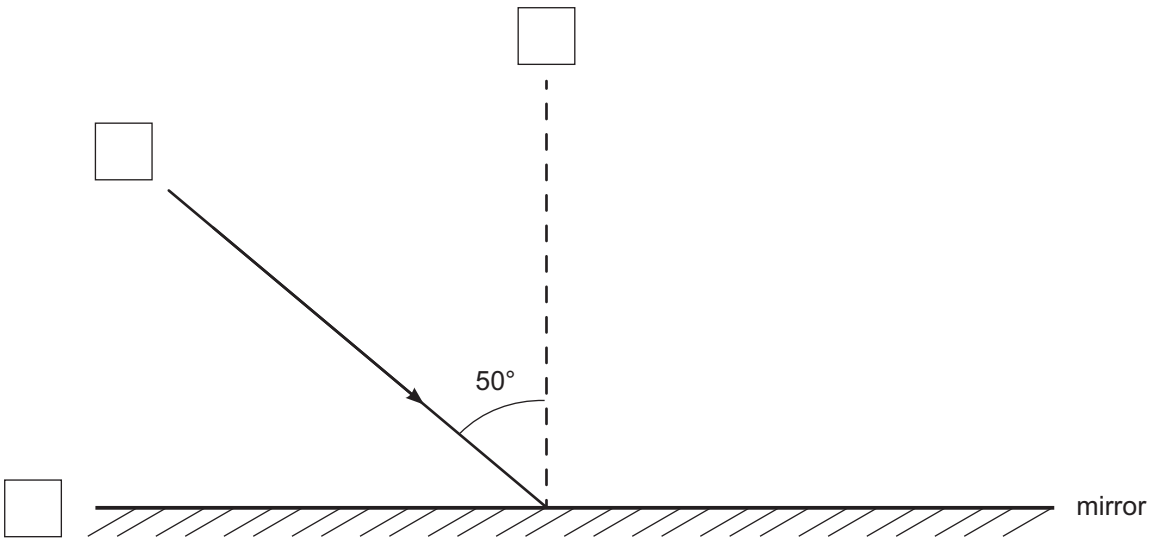
1 A pupil places an object in front of a plane mirror.

(a) Put a tick (✓) in the box beside the **two** statements below that describe the image produced by a plane mirror.

- ☐ The image is bigger than the object.
- ☐ The image is the same size as the object.
- ☐ The image is smaller than the object.
- ☐ The image is real.
- ☐ The image is virtual.

[2]

(b) The pupil draws a ray diagram to show how we see the image in a plane mirror. The diagram is incomplete.



Label the normal by placing the letter **N** in the correct box.

Draw the reflected ray and mark its direction by placing an arrow on the ray.

What is the angle of reflection?

Angle of reflection = _____ ° [4]

2 Waves can be classified as either transverse or longitudinal.

(a) Put the waves below into the correct column in the table.

X-rays	sound	ultraviolet	ultrasound

Transverse waves	Longitudinal waves

[4]

(b) Complete the sentences below that describe waves.

Insert a single word into each sentence.

All waves transfer _____ from one point to another.

In a transverse wave, the particles _____ at right angles to the direction of travel of the wave. [2]

(c) A school carries out a fire alarm test. The frequency of the alarm sound is 1700 Hz and the wavelength of the sound wave is 0.2 m.

Use this information to calculate the velocity of the sound wave.

You are advised to show your working out.

Velocity = _____ m/s [3]

[Turn over

3 The statements below describe some regions and properties of the electromagnetic spectrum.

Complete the statements by using the terms provided in the box.

Each term should only be used once.

gamma rays	**infrared**	**higher**	**lower**	**microwave**
radio waves	**same**	**slowest**	**visible light**	

Statements

Electromagnetic waves all travel at the _____ speed through a vacuum.

_____ have the longest wavelength and the _____ have the shortest wavelength.

Overexposure of electromagnetic radiation can be harmful to the body.

The _____ the frequency of radiation the more damage it is likely to cause. _____ radiation is felt as heat and causes skin burns.

_____ radiation causes internal heating of body tissues.

The radiation which allows us to see is called _____.

[7]

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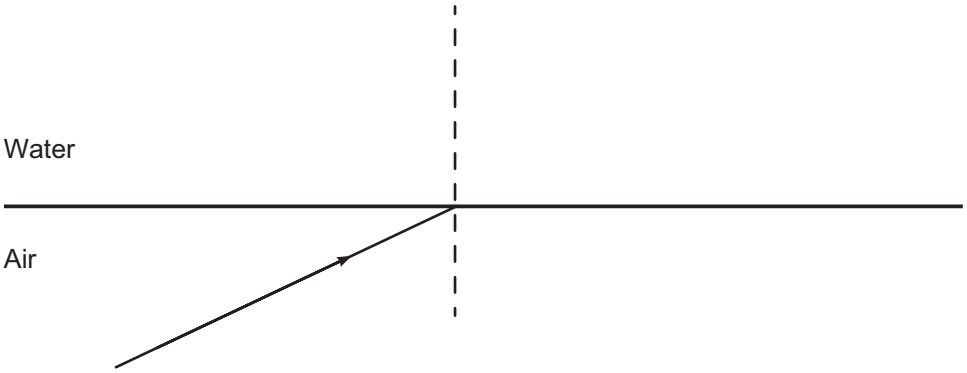
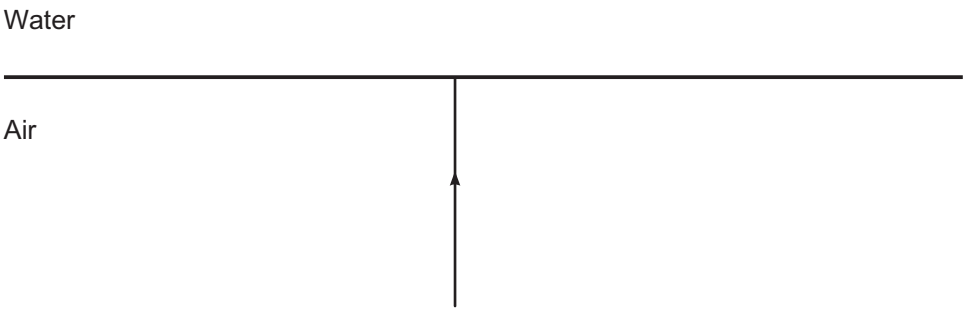
(Questions continue overleaf)

[Turn over

4 When light enters water it sometimes changes direction.

(i) Complete each diagram below to show the path the light ray follows as it travels into the water.





[3]

(ii) Tick (✓) the correct box in each case to complete the following statements.

As the light enters the water its speed

becomes greater. ☐

stays the same. ☐

becomes less. ☐

When the change in speed is greater, the amount of refraction is

greater. ☐

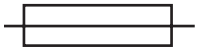
the same. ☐

less. ☐

[2]

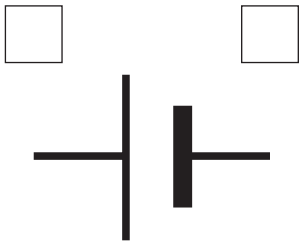
[Turn over

5 **(a)** Complete the table below by filling in the missing names or circuit symbols.
The first one has been completed for you.

Name	Switch			Ammeter	Variable resistor
Symbol					

[4]

(b) Insert the correct symbol in each box below to show the polarity of the cell.



A pupil connects some cells together.
Calculate the total voltage across each combination of cells.
Each cell has a voltage of 1.5 V.

_____ V

_____ V [3]

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(Questions continue overleaf)

[Turn over

6 **(a)** When electricity flows through a resistor it produces a certain form of energy.

Name the form of energy produced.

_____ energy

Name the two particles involved in producing this energy.

_____ and _____

How do these particles produce this form of energy?

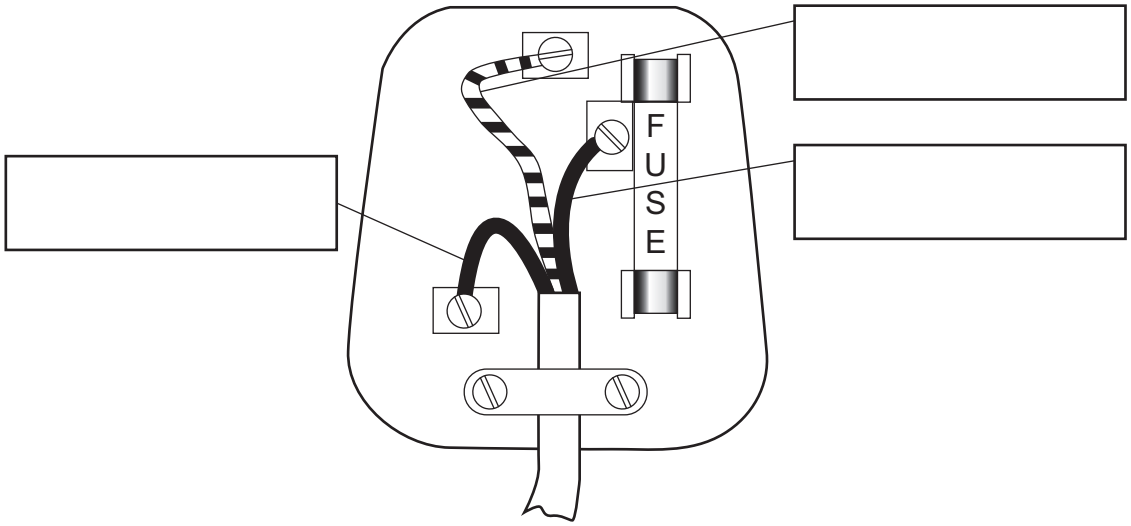
_____ [4]

(b) A kettle has a power of 2.76 kW. The kettle is connected to a mains voltage supply of 230 V. Calculate the current flowing through the kettle.

You are advised to show your working out.

Current = _____ A [4]

(c) Label the diagram of a plug by putting the name for each wire in the correct box.



What could cause the fuse to melt?

_____ [4]

[Turn over

7 White light can be split into different colours in a school science laboratory.

The statements below refer to this experiment.

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

Complete the sections below:

- the name of the process;

_____

- the piece of apparatus used to split the light;

_____

- the names of the colours produced, in order, beginning with **violet**;

_____

_____

_____

- state why the colours are refracted by different amounts;

_____

_____

_____

- state which colour is refracted the least and explain why.

_____

_____

_____ [6]

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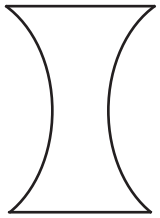
[Turn over

8 Lenses are used to produce images.



(a) Which type of lens is shown above?

_____ [1]

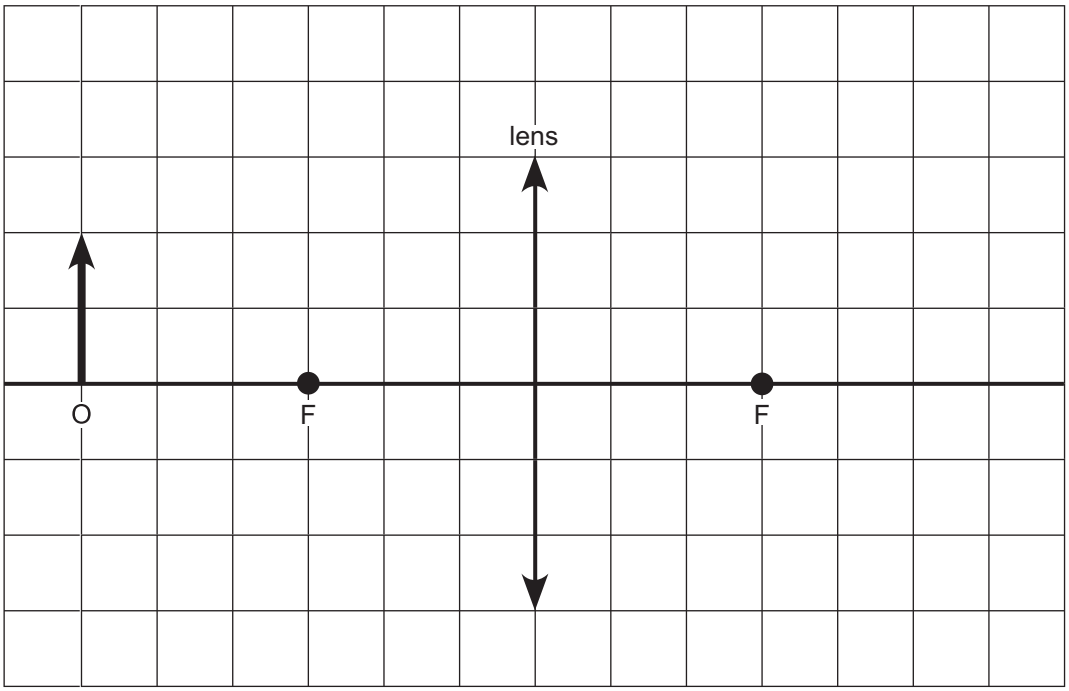
(b) (i) The diagram below shows an object O placed 6 cm from a lens of focal length 3 cm.

Points F represent the focal points.

Complete the diagram to show how the image of O is formed.

Include the following:

- **two rays** from the top of the object passing through the lens;
- arrows to show the directions of these rays;
- the image produced.



[4]

(ii) Select the **two** correct words from the list below that describe the image produced.

Place ticks (✓) in the boxes beside the correct words.

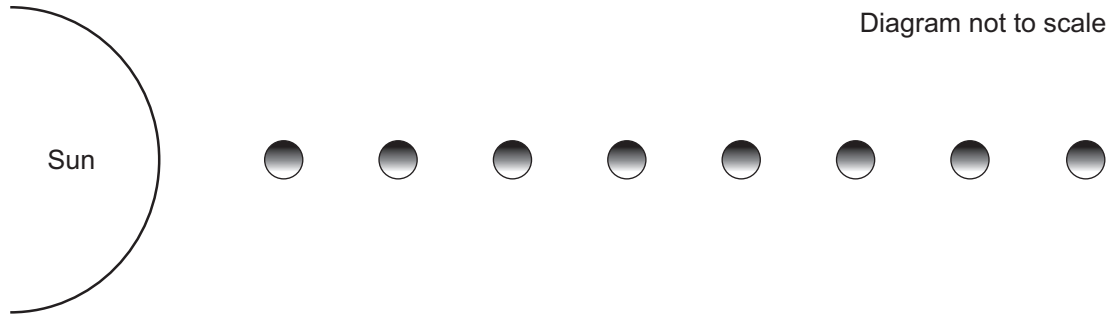
Virtual	☐
Upright	☐
Diminished	☐
Real	☐
Inverted	☐

[2]

[Turn over

9 There are eight planets in our Solar System, as shown below.

Diagram not to scale



Source: Principal Examiner

(a) On the diagram, draw a box around all of the rocky planets. [1]

(b) List the gas planets, in order, starting with the one closest to the Sun.

_____

_____

_____

_____ [3]

(c) Describe briefly how a star is formed.

_____

_____

_____

_____ [3]

(d) State the name of the two main elements found in the Sun.

_____ and _____

How do physicists know that these are the main elements found in the Sun?

_____

_____

Name the process that produces energy in the Sun.

_____ [4]

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For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
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Total Marks	

Examiner Number

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