



Rewarding Learning

General Certificate of Secondary Education
2024

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P2



Foundation Tier

[GDW61]

GDW61

TUESDAY 18 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 seven** 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 **5**.

14025.07R



20GDW6101

- 1 (a) Use the words provided in the box to complete the sentences below.
Each word can only be used **once**.

sound	water	vibrations	ultrasound	frequency
parallel	moving	perpendicular	electromagnetic	

Waves transfer energy from one point to another using _____.

Both _____ waves and _____ waves are examples of transverse waves.

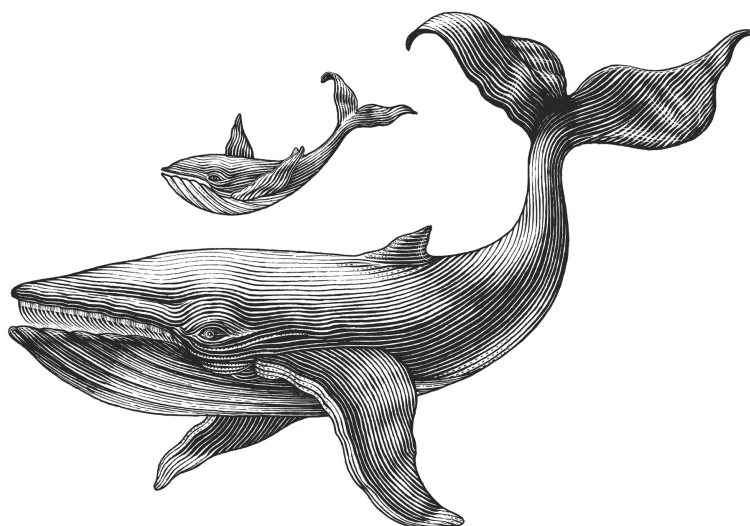
Both _____ waves and _____ waves are examples of longitudinal waves.

In a longitudinal wave the particles vibrate _____ to the direction the wave is travelling.

The _____ of a wave is the number of waves that pass a point in one second.

[7]





Source: © Getty Images

(b) Whales use sound to communicate under water.

The sound wave produced by a whale has a wavelength of 75 m and a frequency of 20 Hz.

Use this information to calculate the velocity of sound in water.

Include the unit in your answer.

You are advised to show your working out.

Velocity = _____ [4]

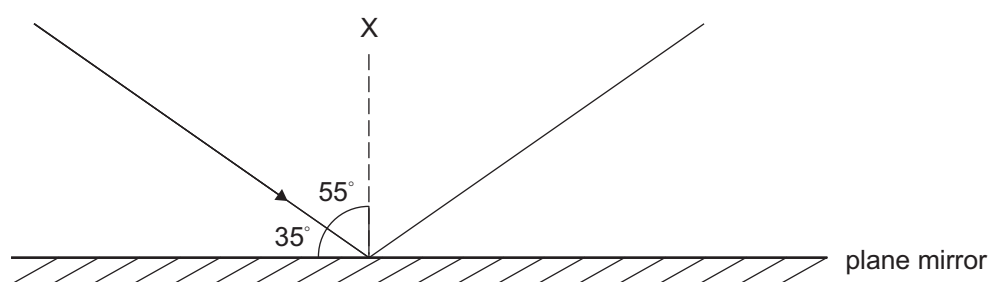
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20GDW6103

- 2 (a) A student draws a ray diagram to show reflection in a plane mirror.



Insert an arrow on the reflected ray to show the direction the light is travelling.

What is the angle of reflection?

Place a tick (✓) in the correct box.

- | | |
|--------------------------|------------|
| ☐ | 0° |
| ☐ | 20° |
| ☐ | 55° |
| ☐ | 90° |

What is the name given to the dotted line labelled X on the ray diagram?

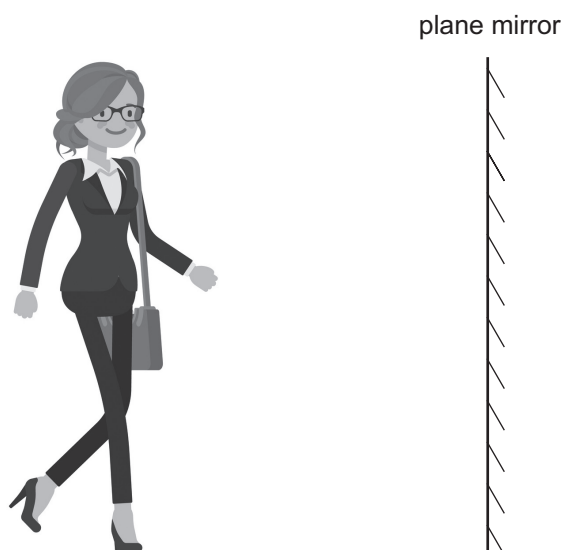
Place a tick (✓) in the correct box.

- | | |
|--------------------------|-------------------|
| ☐ | The incident ray |
| ☐ | The normal |
| ☐ | The reflected ray |

[3]



(b) The diagram below shows a woman looking at her new bag in a plane mirror.



Source: © Getty Images

Place a tick (✓) in each of the **four** correct boxes below that describe the image the woman sees in the plane mirror.

☐

The image is laterally inverted.

☐

The image is the same distance behind the mirror as the object is in front of the mirror.

☐

The image is vertically inverted.

☐

The image is real.

☐

The image is bigger than the object.

☐

The image is smaller than the object.

☐

The image is the same size as the object.

☐

The image is virtual.

[4]

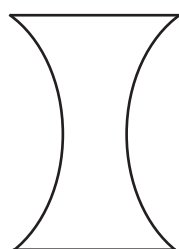
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20GDW6105

(c) The shapes of three pieces of glass are shown below.



A



B



C

(i) Which shape, A, B or C, is a **diverging** lens? _____

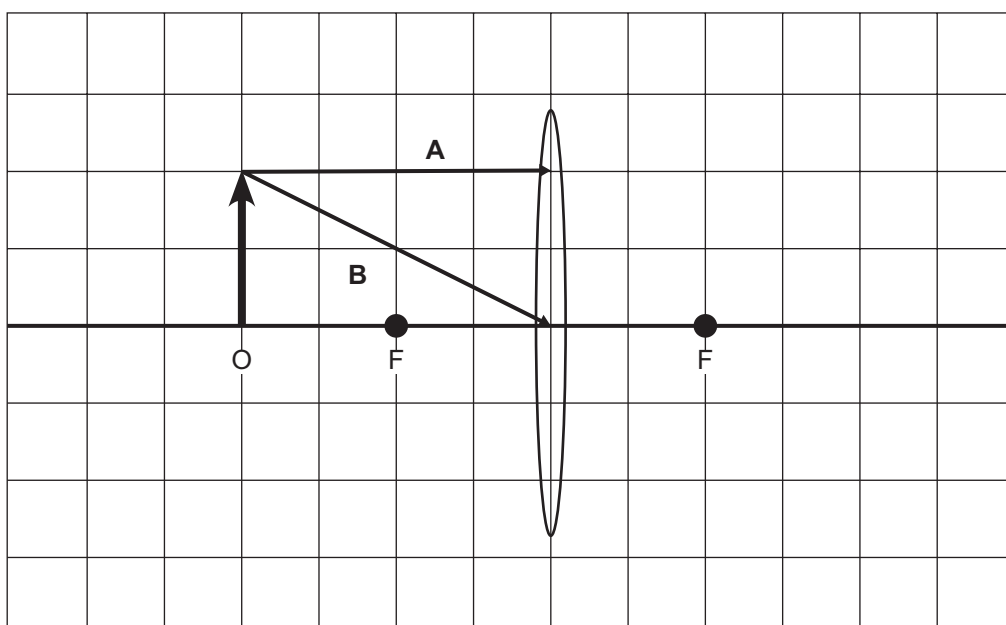
Which shape, A, B or C, is a **converging** lens? _____ [2]

(ii) Lenses are used to produce images.

The ray diagram below shows two rays of light, **A** and **B**, from the top of an object, **O**.

Complete the ray diagram to show the formation of the image by extending rays **A** and **B** after they pass through the lens.

Mark clearly the position of the image.



[3]





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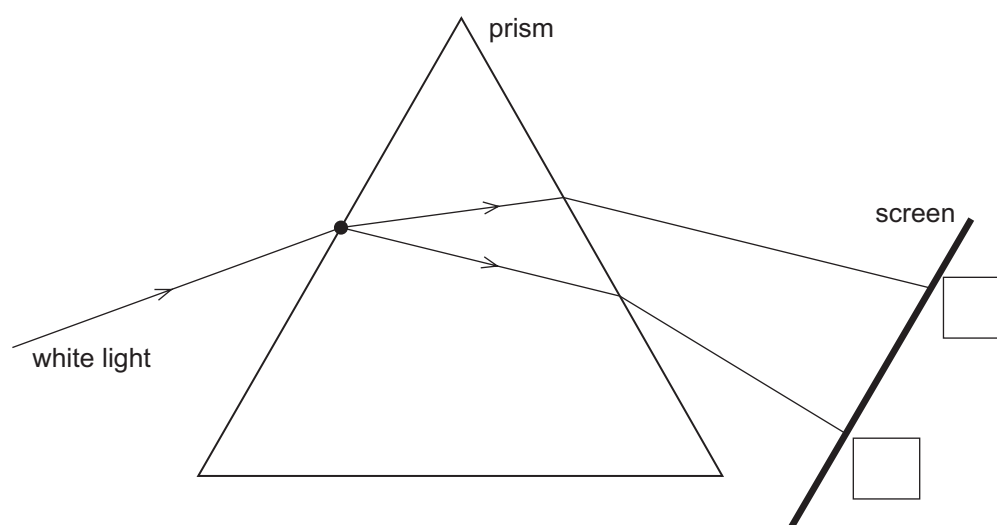
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20GDW6107

- 3 (a) The diagram below shows what happens to white light as it passes through a glass prism.



Complete the sentences below.

- (i) The name given to the range of colours produced on the screen is a

_____ .

[1]

- (ii) List the colours appearing on the screen in order, starting with red.

Red, _____

_____ [2]

- (iii) Place the letters **R** for red and **V** for violet inside the correct boxes on the diagram. [2]

- (iv) The white light splits up in the prism because different _____
travel at different _____ in glass. [2]



(b) When light enters water, it can change direction.

Complete both diagrams below to show the paths the light rays follow as they travel through the water.

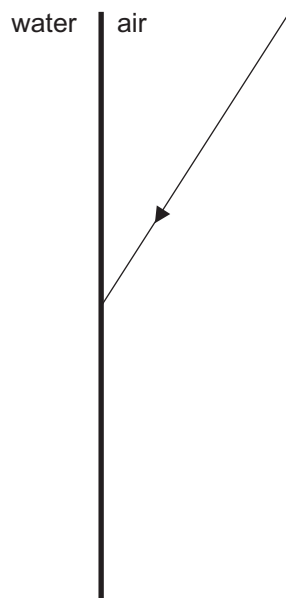


Diagram 1

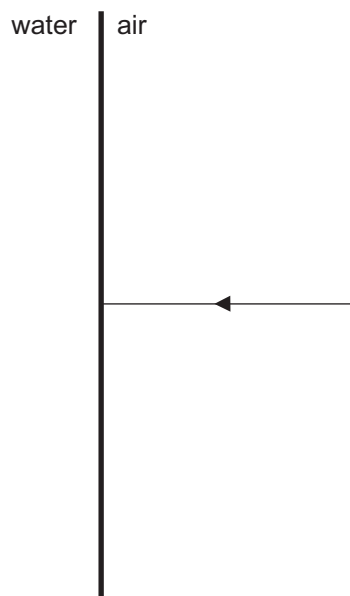


Diagram 2

[3]

[Turn over]

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20GDW6109

4 Complete the sentences below that describe the Big Bang.

The Big Bang was a massive explosion that marked the beginning of the

_____.

According to current measurements the Big Bang occurred fourteen

_____ years ago.

The main evidence for the Big Bang is that _____ from other galaxies

is shifted to the _____ end of the visible spectrum.

This can be explained by space _____.

[5]



5 The electromagnetic spectrum consists of seven different regions.

Describe the main features of the electromagnetic spectrum.

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 name of the electromagnetic wave with the longest wavelength;

the name of the electromagnetic wave with the shortest wavelength;

the name of the electromagnetic wave that is emitted by hot objects;

the names of the **three** electromagnetic waves that can cause cancer.

[6]



6 (a) Electricity companies bill customers for each unit of electricity used.

Each unit is equal to one kilowatt-hour.

Complete the statements below by placing a tick (✓) in the correct box.

A kilowatt-hour is a measurement of

☐

power.

☐

energy.

☐

time.

A kilowatt-hour is when

☐

a 1000 W appliance is used for 60 seconds.

☐

a 1000 W appliance is used for 3600 seconds.

☐

a 100 W appliance is used for 360 seconds.

[2]



- (b) A dog owner uses an electric shower to wash a dog. The shower has a power rating of 8000 W and it takes 15 minutes to shower the dog.

By first finding how many units are used, calculate the cost, in pence, of showering the dog.

Each unit of electricity costs 30p.

You are advised to show your working out.

Number of units used = _____

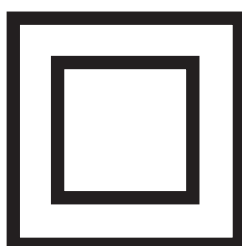
Cost of showering the dog = _____ p [5]



- (c) (i) Describe **fully** how a fuse helps to protect appliances from potential damage if a fault develops.

[3]

If the symbol below is shown on an appliance, it means it is double insulated.



- (ii) Complete the statement below by placing a tick (✓) in the correct box.

The cable connecting a double insulated appliance to the plug contains

- | | |
|--------------------------|------------------|
| ☐ | one earth wire. |
| ☐ | no earth wire. |
| ☐ | two earth wires. |

State how a double insulated appliance protects the user if a fault develops.

[2]





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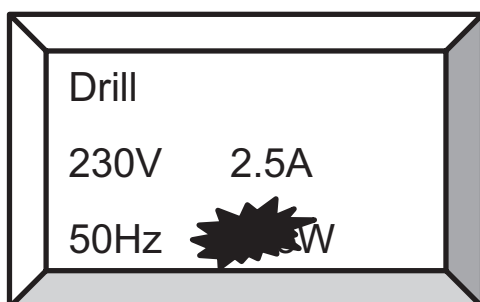
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20GDW6115

- 7 (a) An information plate provides data about an electric appliance.

The information plate below is from an electric drill.



Source: © Getty Images

- (i) Information about the power of the drill is missing.

Use the data on the information plate to calculate the power of the drill.

You are advised to show your working out.

Power = _____ W [3]

- (ii) A workman wants to know the electrical resistance of the drill.

Use the data on the information plate to calculate the electrical resistance of the drill.

You are advised to show your working out.

Electrical resistance = _____ Ω [3]



(iii) The workman uses the drill for 30 seconds.

Use the data on the information plate to calculate how much charge passes through the drill during the 30 seconds.

Include the unit in your answer.

You are advised to show your working out.

Charge = _____ [4]

(b) The workman uses a different drill later that same day.

It has a power of 1000 W and is used for 2 minutes.

Calculate the energy used by this drill during the 2 minutes.

You are advised to show your working out.

Energy = _____ J [4]

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Question Number	Marks
1	
2	
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7	

Total Marks	
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Examiner Number

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