



General Certificate of Secondary Education
2025–2026

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P1

Higher Tier



[GDW32]

GDW32

WEDNESDAY 12 NOVEMBER 2025, MORNING

TIME

1 hour.

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 70.

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.

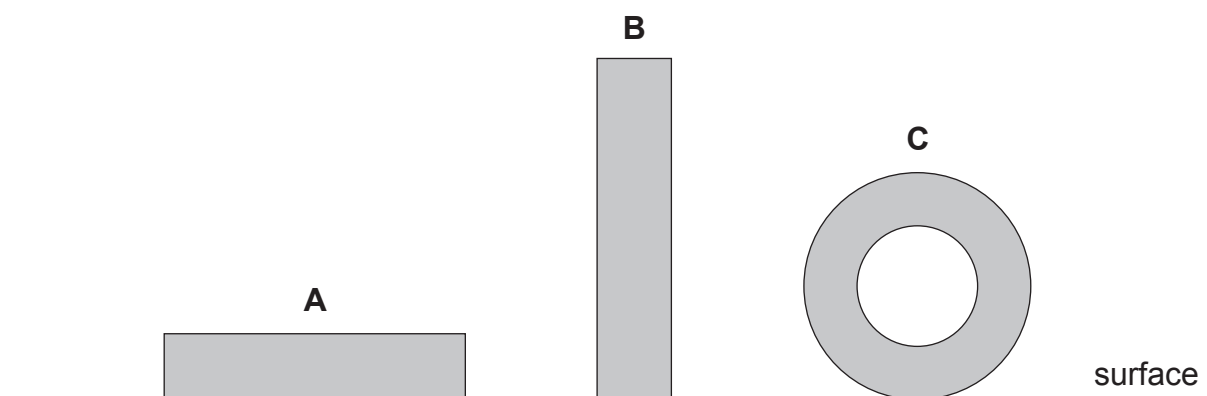
Quality of written communication will be assessed in Question 2.

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- 1 Two boxes **A** and **B** and a ring **C**, are placed on a level surface as shown below.



- (a) Which object is the **most** stable?

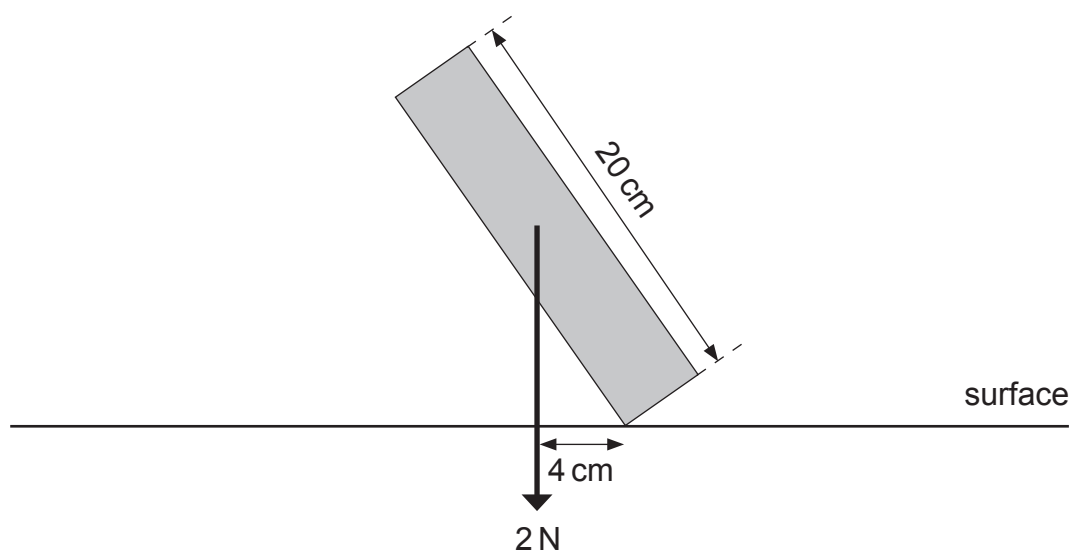
Object _____

Give two reasons for your answer.

1. _____
2. _____ [3]



(b) Another object is tilted as shown below.



Calculate the moment created by the 2 N force.

Include the unit in your answer.

Do not change any units.

Show your working out.

Moment = _____ [5]

[Turn over]



- 2 You are asked to write an account of how a student could find their personal power as they climb a flight of stairs.

The student already knows their weight.

Your answer should include:

- the **two** measuring instruments required;
- the **two** measurements taken;
- the formulae needed to find the work done and power.

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

Measuring instruments

Measurements

Formula, **in words**, to find work done

Formula, **in words**, to find power

[6]



3 This question is about atoms and isotopes.

(a) Define an isotope in terms of **particles**.

[2]

(b) The nucleus of an atom can be described by using the following notation.



What does the letter A represent in the above notation?

What does the letter Z represent in the above notation?

Which letter, A or Z, would have the same value for two isotopes of the same element?

[3]

(c) Give the **names** of the two isotopes of hydrogen that could be used to produce power in a nuclear fusion reactor.

1. _____

2. _____ [2]

[Turn over



- 4 (a) Define the term half-life.

_____ [2]

- (b) A radioactive source has an activity of 1800 Bq.

The activity of the source was 225 Bq when measured again six hours later.

Calculate the half-life of the source.

Show your working out.

Half-life = _____ hours [3]

- (c) State the type of radioactive source (**alpha, beta or gamma**) for the uses below.
State the length of half-life (**short or long**) best suited for each use.

Use: smoke alarms

Type: _____

Length of half-life: _____

Use: finding the route of water pipes buried deep underground

Type: _____

Length of half-life: _____ [4]



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(Questions continue overleaf)

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[Turn over



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- 5 (a) An empty glass bottle is placed in three different positions on a flat table as shown below.



In which position, **A**, **B** or **C**, is the least pressure exerted on the table?

Position: _____

Explain **fully** your answer: _____

_____ [3]



(b) (i) A bottle has a mass of 0.48 kg.

The area in contact with the table is 0.008 m^2 .

Calculate the pressure exerted by the bottle on the table.

Show your working out.

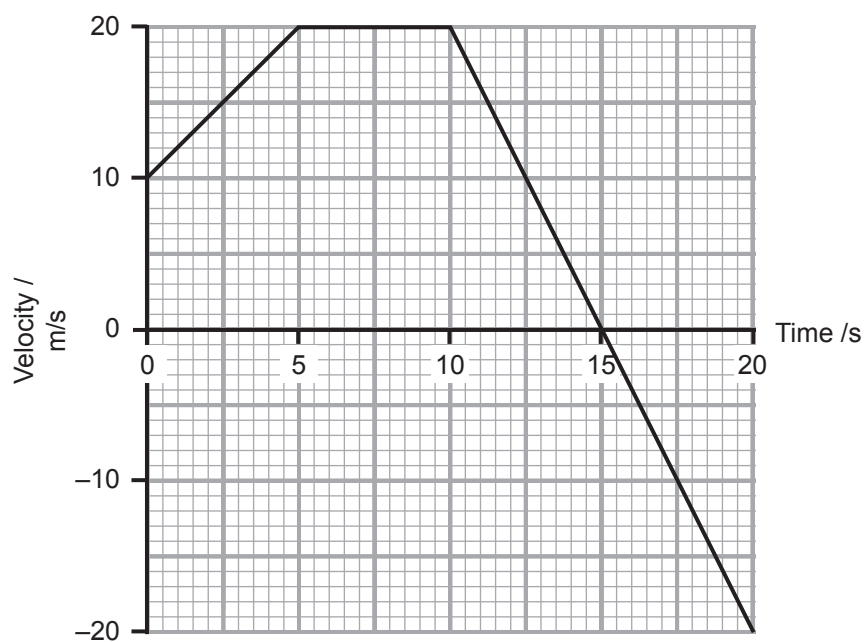
Pressure = _____ N/m^2 [4]

(ii) Express your answer to **(b)(i)** in pascals (Pa).

Pressure = _____ Pa [1]



- 6 (a) The velocity-time graph for an object is shown below.



- (i) Calculate the average velocity of the object during the time period 0 to 5 seconds.

Show your working out.

Average velocity = _____ m/s [3]



- (ii) Calculate the distance travelled by the object during the time period 15 to 20 seconds.

Show your working out.

Distance = _____ m [3]

- (b) (i) State the difference between a vector and a scalar quantity.

_____ [1]

- (ii) Distance is a scalar quantity.

What is the vector equivalent of distance?

Acceleration is a vector quantity.

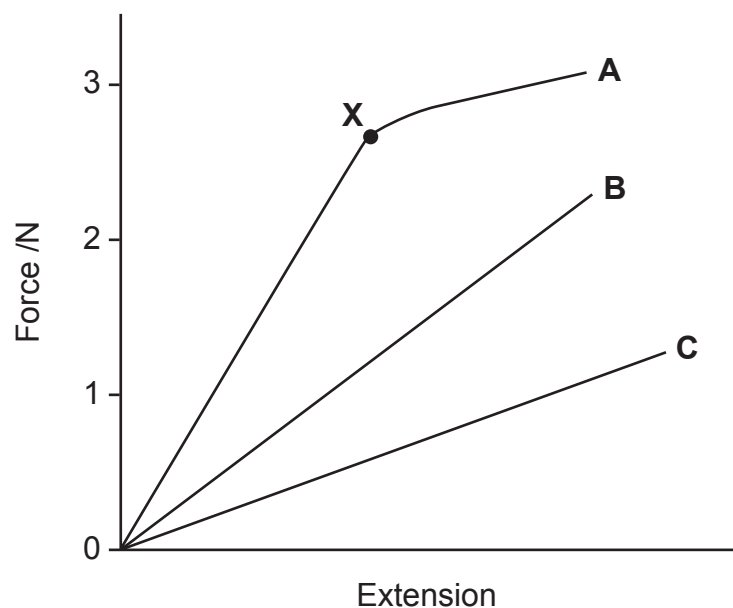
What is the scalar equivalent of acceleration?

_____ [2]

[Turn over]



- 7 (a) The graph below shows how the extension of three different springs, **A**, **B** and **C**, varies with the force applied.



Which spring, **A**, **B** or **C**, has the smallest spring constant?

Spring _____

Explain your answer.

Which spring, **A**, **B** or **C**, would have the least amount of extension for a 1 N applied force?

Spring _____

What is the name of the point labelled **X**?

_____ [4]



(b) A person jumps from a high bridge using a bungee rope.



The person has a weight of 660 N.

The bungee rope has an unstretched length of 55 m and obeys Hooke's law.

When the person comes to rest, the bungee rope has a total length of 70 m.

Calculate the spring constant of the bungee rope.

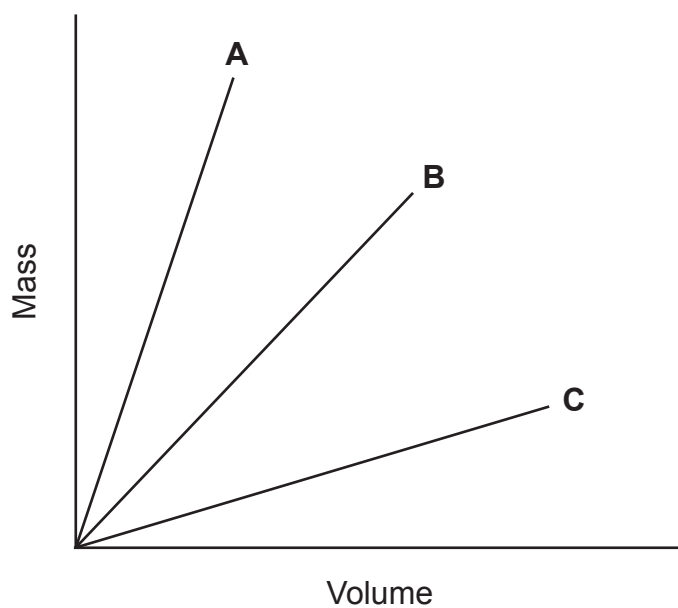
Show your working out.

Spring constant = _____ N/m [4]

[Turn over]



- 8 (a) A graph of mass against volume is drawn for 3 different materials, **A**, **B** and **C**.



Place one tick (✓) per row in the table below to indicate which material best fits each description.

	A	B	C
Largest density			
Largest mass to volume ratio			

[2]



- (b) A student wants to calculate the density of a liquid and records the results shown in the table below.

Mass of empty measuring cylinder	60.0 g
Mass of measuring cylinder and liquid	87.0 g
Volume of liquid	31 cm ³

Use the information from the table to calculate the density of the liquid.

Give your answer to 1 decimal place.

Include the unit in your answer.

Do not change any units.

Show your working out.

Density = _____ [6]

[Turn over



9 A cyclist competes in a race.



The cyclist accelerates from rest to 12 m/s in a time of 3 seconds.

The resultant force that causes this acceleration is 292 N.

The mass of the bike is 8 kg.

By first finding the acceleration, calculate the mass of the cyclist.

Show your working out.

Acceleration = _____ m/s²

Mass of the cyclist = _____ kg [7]



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Question Number	Marks
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Total Marks	
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Examiner Number

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