



General Certificate of Secondary Education
2024–2025

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P1

Higher Tier



[GDW32]

GDW32

FRIDAY 28 FEBRUARY 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 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 3.

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- 1 (a) A vase is placed on a table as shown below.



- (i) The combined weight of the vase, its contents and the table is 62.4 N.

The pressure exerted on the floor is 5.2 N/cm².

Calculate the area of the legs of the table in contact with the floor.

Show your working out.

Area = _____ cm² [3]



(ii) Some water is poured into the vase.

State what will happen to the pressure exerted on the floor.
Explain your answer.

The pressure will _____ because _____

_____ [2]

(b) A box is placed on a table.

The box exerts a pressure of 83 N/m^2 on the table.

What is the pressure exerted by the box in pascals (Pa)?

Pressure = _____ Pa [1]

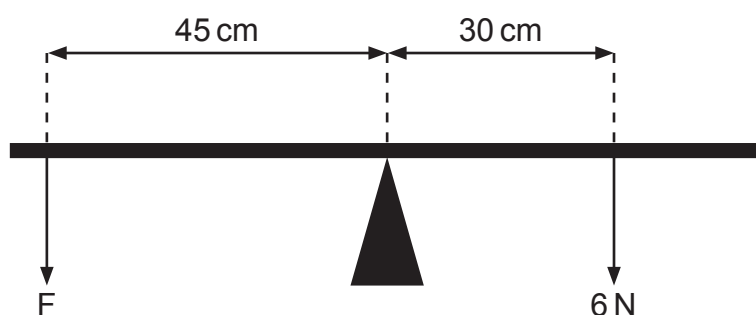
[Turn over



- 2 (a) Explain fully how you would calculate the moment of a force and give the unit.

Unit for a moment = _____ [4]

- (b) A uniform metre rule is balanced at its midpoint as shown below.



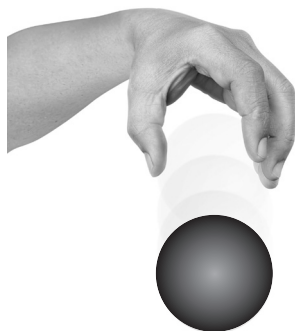
Use the Principle of Moments to calculate the size of force F .

Show your working out.

$F =$ _____ N [4]



- 3 This question is about the Principle of Conservation of Energy when a ball is dropped from rest.



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

State the Principle of Conservation of Energy.

State the form of energy stored by the ball when it is held at rest above the ground.

Give the main form of energy gained by the ball as it falls towards the ground.

What two forms of energy are produced when the ball hits the ground?

[6]

[Turn over



4 This question is about the dangers of radioactivity.

(a) Radioactive emissions can cause ionisation.

What is meant by ionisation?

What damage can ionisation cause to living cells?

 [3]

(b) Give the name of one type of radioactive emission that **can** pass through skin.

Give the name of the type of radioactive emission that **cannot** pass through skin.

 [2]

(c) State three ways to reduce the risk to a person when handling radioactive sources.

1.

2.

3.

 [3]





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(Questions continue overleaf)

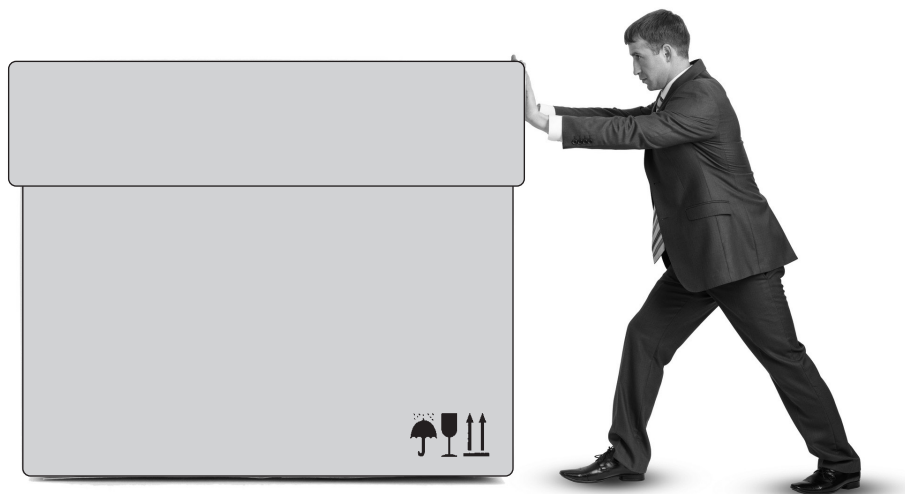
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[Turn over



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- 5 A force is used to push a box along a flat surface as shown below.



- (a) The box is pushed a distance of 425 cm and 252 J of work is done.

Calculate the force applied.

Give your answer to one decimal place.

Show your working out.

Force = _____ N [5]



(b) The work done in pushing another box for 2 minutes is 1800 J.

Calculate the power developed.

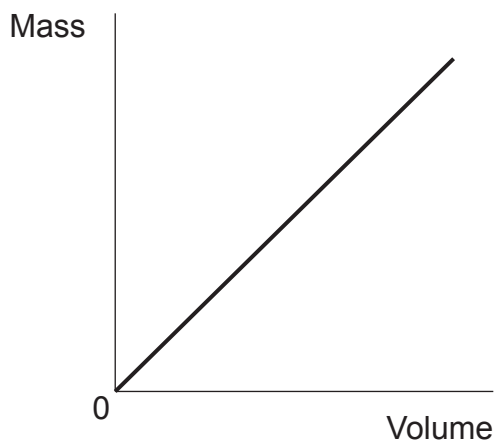
Include the unit in your answer.

Show your working out.

Power = _____ [5]



- 6 (a) The graph of mass against volume for several objects was drawn, as shown below.



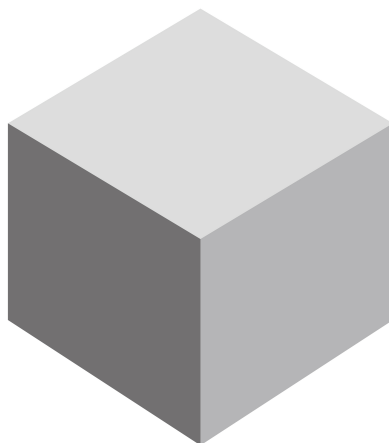
What does the graph tell you about the density of the objects?

State what happens to the mass if the volume increases by a factor of 4.

[2]



(b) A student is investigating the density of a solid metal cube.



Each side of the cube measures 4 cm and its density is 3 g/cm^3 .

Calculate the mass of the cube.

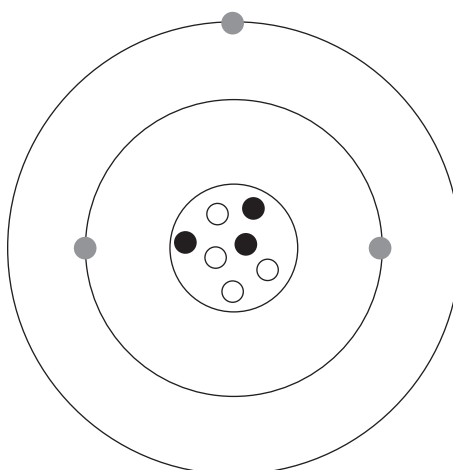
Show your working out.

Mass = _____ g [4]

[Turn over



- 7 (a) The diagram below shows a neutral atom of an element X.



How many neutral particles are in the atom?

Number of neutral particles = _____

How many positive particles are in the atom?

Number of positive particles = _____

State the **total** relative mass of the nucleus of the atom shown.

Total relative mass of the nucleus = _____ [3]



(b) A **neutral** atom of element **Q** contains 6 neutrons and 5 electrons.

Insert numbers in the boxes below so that it represents the **nucleus** of this atom.

Q

[2]

(c) What are isotopes? Give your answer in terms of **particles**.

[2]

[Turn over

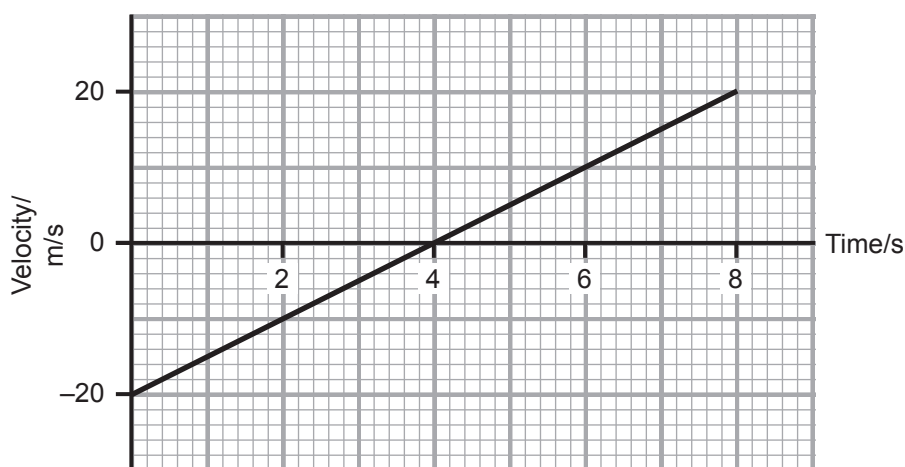


8 (a) What is the **difference** between a scalar and a vector quantity?

Are velocity and acceleration vector or scalar quantities?

_____ [2]

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



(i) How is the object travelling differently in the time period 0 to 4 seconds compared to the time period 4 to 8 seconds?

_____ [1]



- (ii) Use the graph to calculate the acceleration of the object during the time period 0 to 4 seconds.

Show your working out.

Acceleration = _____ m/s² [3]

- (iii) Use the graph to calculate the total **distance** travelled by the object during the time period 0 to 8 seconds.

Show your working out.

Distance = _____ m [4]

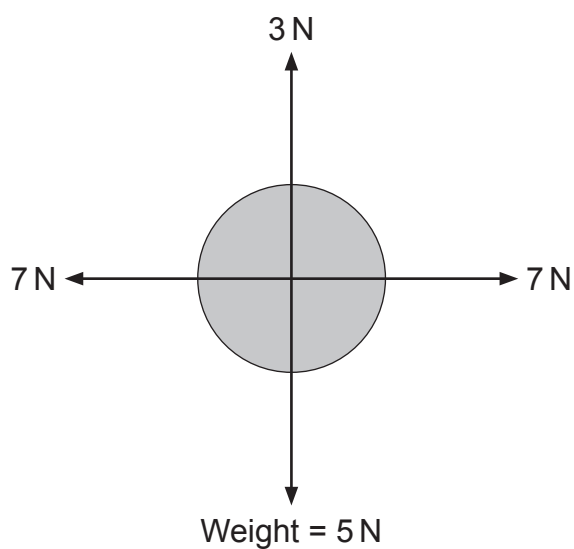
- (iv) What is the **displacement** of the object at 8 seconds compared to where it was at 0 seconds?

Displacement = _____ m [1]

[Turn over



- 9 The diagram below shows the forces acting on an object.



- (i) What is the size of the resultant force acting horizontally on the object?

Resultant force acting horizontally = _____ N [1]



- (ii) By first calculating the resultant force acting on the object, calculate the acceleration and state its direction.

Show your working out.

Acceleration = _____ m/s²

Direction of acceleration = _____ [7]

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Question Number	Marks
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Examiner Number

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