



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
Foundation Tier



[GDW31]

GDW31

THURSDAY 22 MAY 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 60.

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 8.

14900



16GDW3101

1 Energy can exist in many forms.

(i) Circle the **three** forms of energy shown in the box below.

power	heat	pressure
magnetic	strain	weight

[3]

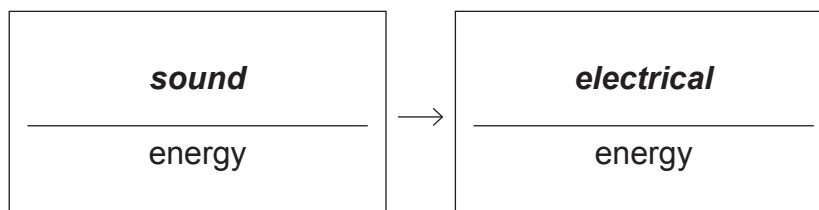


Energy can be changed from one form to another.

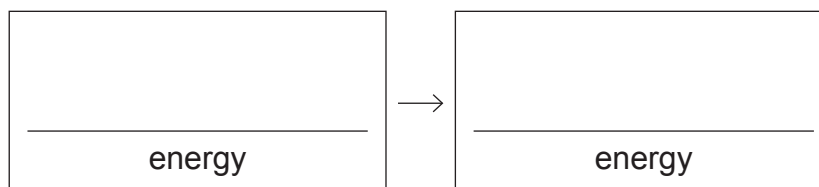
- (ii) Complete the boxes to show the **useful** energy change that is happening in each of the devices below.

An example has been completed for you.

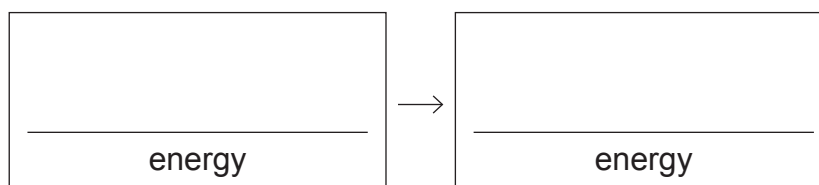
Example: A microphone



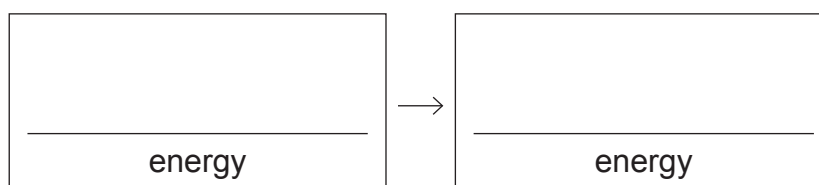
A petrol engine



A solar cell



A loudspeaker



[6]

[Turn over



2 Energy resources can be renewable or non-renewable.

(i) State what is meant by a **renewable** energy resource.

[1]

(ii) Place each of the following energy resources in the correct column below.

wood	oil	natural gas	geothermal
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Renewable	Non-renewable

[4]





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(Questions continue overleaf)

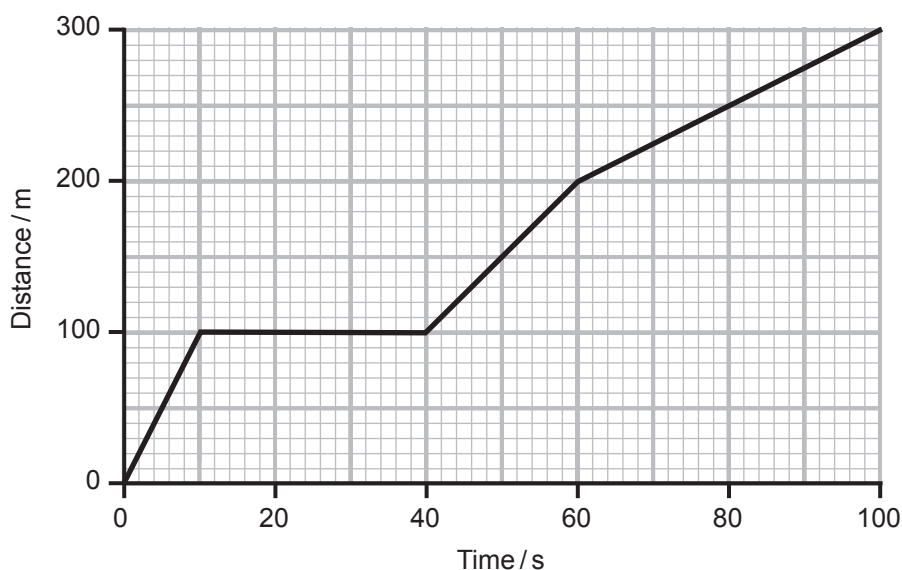
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[Turn over



16GDW3105

- 3 (a) The graph of distance against time for part of a car journey is shown below.



- (i) During which time period is the car travelling the fastest?

_____ to _____ seconds

How far has the car travelled during the time period 0 to 40 seconds?

_____ m

Describe the motion of the car during the time period 10 to 40 seconds.

_____ [3]



- (ii) Use values from the graph to calculate the average speed of the car during the time period 0 to 100 seconds.

Show your working out.

Average speed = _____ m/s [3]

- (b) On a different journey, the car starts from rest and increases its speed to 20 m/s in a time of 5 seconds.

Calculate the rate of change of speed of the car.

Show your working out.

Rate of change of speed = _____ m/s² [3]

[Turn over



- 4 A van is moving forwards in a straight line.

The forces acting on the van in three different situations are shown below.

A



B



C



Complete the table below by inserting the letter that applies to each situation.

Situation	A, B or C
The speed of the car is constant	
The speed of the car is increasing	
The speed of the car is decreasing	

[3]



- 5 A football of mass 0.4 kg hits a net with a speed of 30 m/s.



Calculate the kinetic energy of the football as it hits the net.

Include the unit in your answer.

Show your working out.

Kinetic energy of the football = _____ [4]

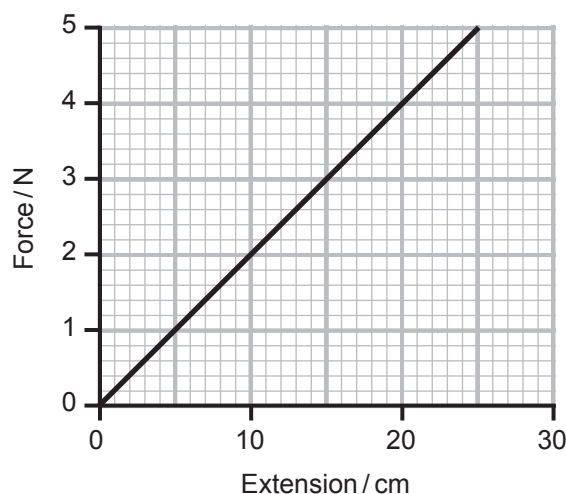
[Turn over]



6 (a) State Hooke's law.

[2]

(b) A student plots a graph of force against extension of a spring as shown below.



(i) The spring has an unstretched length of 2 cm.

Use the graph to find the **total length** of the spring when a force of 4 N is applied to it.

Show your working out.

Total length = _____ cm [2]



(ii) Use values from the graph to calculate the spring constant.

Include the unit in your answer.

Do not change any units.

Show your working out.

Spring constant = _____ [4]



7 This question is about radioactivity.

(a) Complete the table below by stating the type of radiation that would be best suited to each of the uses described.

Use	Type of radiation
Smoke alarms	
Sterilising medical equipment	
Controlling the thickness of aluminium as it is rolled into thin sheets	
Locating pipes deep underground	

[4]

(b) Give two **different** steps taken to reduce the risk when using radioactive sources.

1. _____

2. _____ [2]



8 Write an account of nuclear fusion using the headings below.

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

Explain what happens when nuclear fusion occurs:

State where nuclear fusion occurs naturally:

Name the two isotopes of hydrogen that could be used for nuclear fusion:

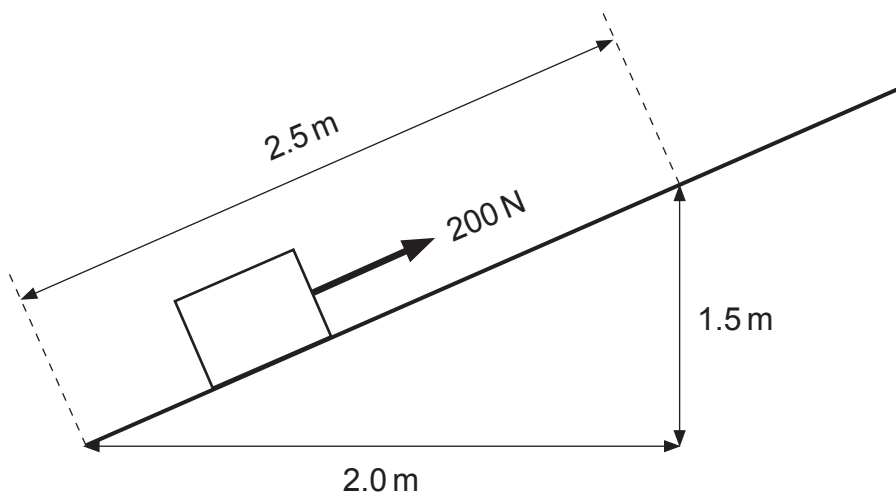
State the major by-product of nuclear fusion:

[6]

[Turn over



- 9 (a) A box is pulled up a slope as shown below.



A force of 200 N is used to pull the box 2.5 m up the slope.

Calculate the work done.

Show your working out.

Work done = _____ J [4]

- (b) In words, define power.

_____ [2]



(c) On another occasion, 640 J of work is done in pulling a different box up a slope.

This generates 160 W of power.

Calculate the time taken to pull this box up the slope.

Show your working out.

Time taken = _____ s [4]

THIS IS THE END OF THE QUESTION PAPER



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Q9(a) . . . Principal Examiner

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For Examiner's use only	
Question Number	Marks
1	
2	
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8	
9	

Total Marks	
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Examiner Number

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