Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2022

Double Award Science: Physics

Unit 7 Practical Skills
Booklet B
Foundation Tier

[GDW74]

GDW74

THURSDAY 23 JUNE, MORNING

TIME

30 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** questions.

INFORMATION FOR CANDIDATES

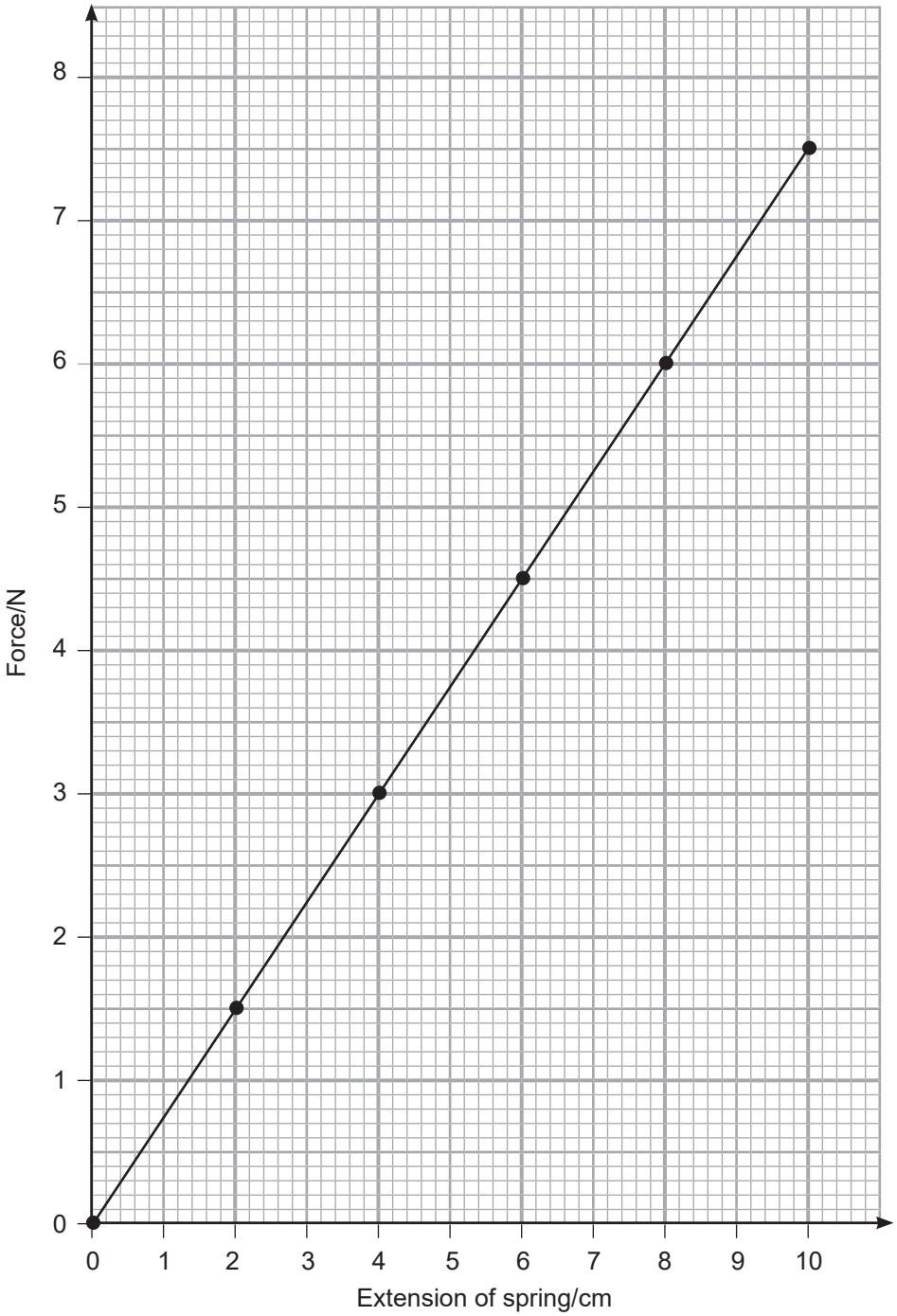
The total mark for this paper is 35.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **3(a)**.

13211

1 A student carries out an investigation to see how the extension of a spiral spring depends on the force causing the extension.

The results of the investigation have been plotted on a graph as shown below.

The **unstretched length** of the spring is 5 cm.



13211

(a) (i) Use the graph to find the extension of the spring for a force of 6 N.

Extension of spring = _____ cm [1]

(ii) What is the **total length** of the spring at 6 N?

Total length of spring = _____ cm [1]

(iii) Use the graph to calculate the spring constant for the spring.

You are advised to show your working out.

Spring constant = _____ N/cm [3]

(b) (i) The spring obeys an important law.

State the name of this law.

_____ [1]

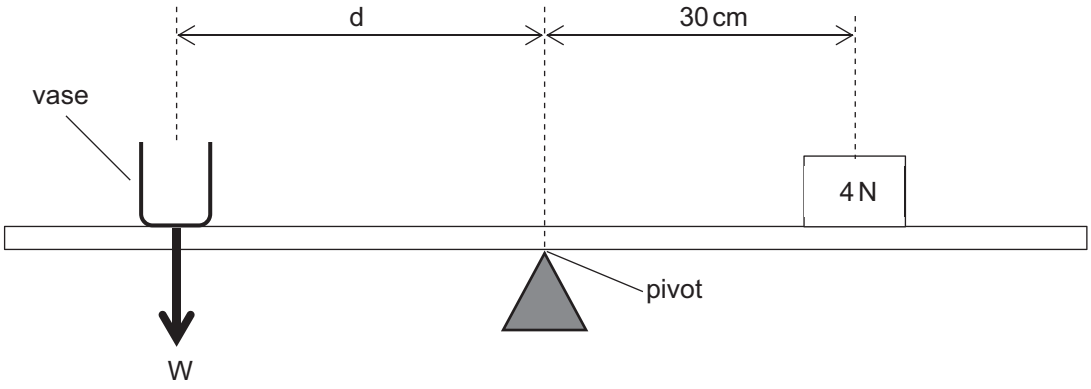
(ii) State the law in words.

_____

_____ [2]

[Turn over

2 **(a)** The principle of moments can be used to find the weight of an object.
The lever below is used to find the weight, W, of a vase.



Source: Chief Examiner

The pivot is placed at the mid-point of the lever.

A 4 N weight is placed on one side and the distance d varied until the lever is balanced.

(i) Calculate the size of the clockwise moment. Do not change any units.

Remember to include the unit.

You are advised to show your working out.

Clockwise moment = _____ [4]

When the distance d is 40 cm, the lever is balanced.

(ii) Use the answer from **(a)(i)** and the Principle of Moments to calculate the weight, W, of the vase.

You are advised to show your working out.

Weight of the vase = _____ N [3]

(b) A different vase is placed on a bench as shown in diagram 1.

The vase is then filled with water as shown in diagram 2.

Source: Chief Examiner

What effect does adding the water have on the stability of the vase?

Choose from the following by placing a tick (✓) in the box.

Stability decreases. ☐

Stability increases. ☐

Stability remains the same. ☐

Explain your choice.

_____

_____ [3]

[Turn over

3 **(a)** A student is given a plastic bottle of cooking oil.

He wants to find the density of the cooking oil.

In addition to the bottle of cooking oil he is only given two other measuring instruments.

© Getty Images

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

Give the names of the two measuring instruments needed.

1. _____

2. _____

State the two measurements that are needed to find the mass of the oil.

1. _____

2. _____

What other measurement is needed to find the density of the oil?

_____

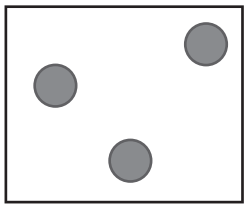
State fully, **in words**, the equation used to calculate density.

_____ [6]

(b) Kinetic theory can be used to explain the difference between the densities of solids, liquids and gases.

The plastic bottle of oil consists of a solid, a liquid and an air gap above the oil.

Insert the word **oil**, **plastic** or **air** beside the correct particle diagram below.



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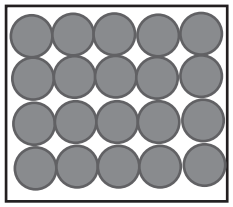

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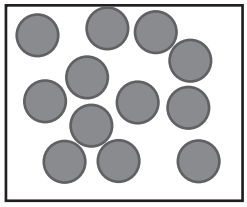

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Source: Chief Examiner

[3]

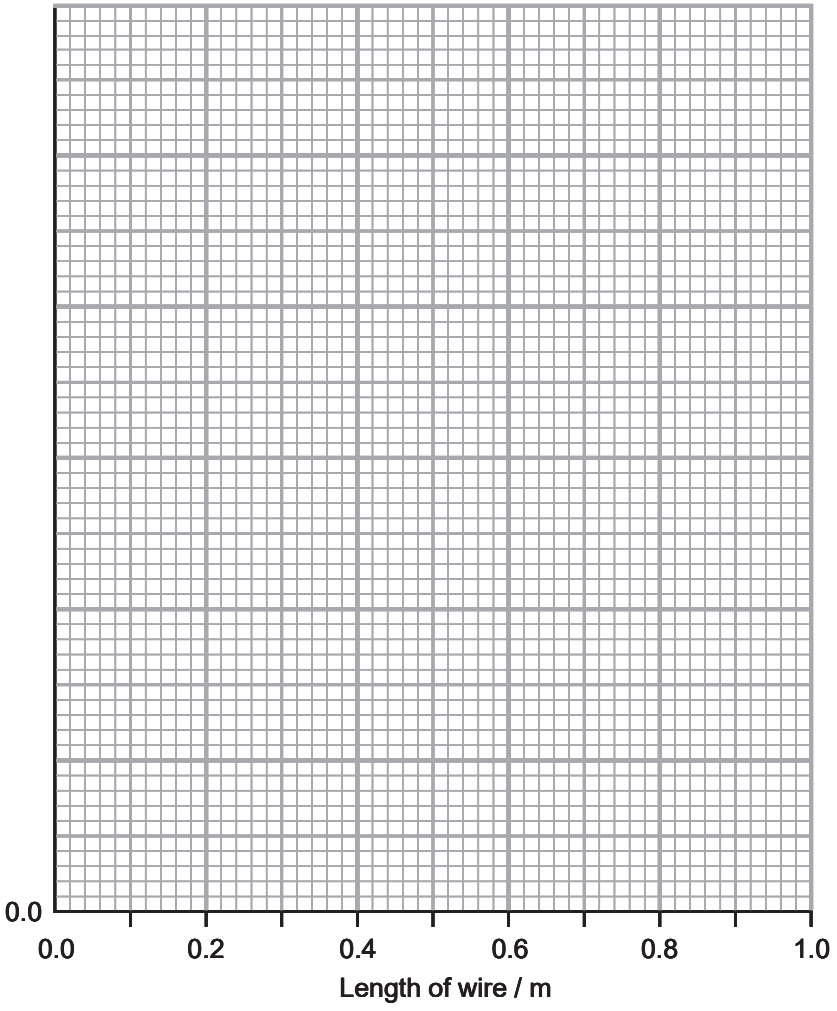
[Turn over

4 A scientist carries out an investigation to find how the resistance of a metal wire depends on the length of the wire.

The table below shows the results obtained.

Length of wire / m	Resistance of wire / Ω
0.1	0.6
0.2	1.2
0.4	2.4
0.6	3.6
0.9	5.4

You are asked to plot a graph of resistance of wire (vertical axis) against length of wire (horizontal axis).



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(a) Choose a suitable scale for the vertical axis and label it.

Plot the points.

Draw a straight line of best fit. [5]

(b) Calculate the gradient of the line you have drawn.

You are advised to show your working out.

Gradient of the line = _____ Ω/m [3]

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Question Number	**Marks**
1	
2	
3	
4	
Total Marks	

Examiner Number

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