GCSE

MONDAY, 8 JANUARY – FRIDAY, 9 FEBRUARY 2024

PHYSICS – Unit 3 (3420U30)

PRACTICAL ASSESSMENT

INVESTIGATING THE MOTION OF A FALLING OBJECT

SECTION B

1 hour, plus your additional time allowance

Surname _____

First name(s) _____

Centre Number _____

Candidate Number 0 _____

ADDITIONAL MATERIALS

A calculator and your Section A exam paper.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball-point pen or your usual method.

Write your name, centre number and candidate number in the spaces provided on the front cover.

Answer ALL questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional pages at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

The total number of marks available for this section of the task is 24.

The number of marks is given in brackets at the end of each question or part-question.

This task is in 2 sections, A and B. You will have completed Section A in a previous lesson.

For Examiner's use only		
	Maximum Mark	Mark Awarded
Section B	24	

SECTION B

Answer ALL questions.

2 (a)(i) State the independent variable in this experiment. [1 mark]

_____

_____

(ii) State the dependent variable in this experiment. [1 mark]

_____

_____

(iii) State the range of the independent variable. [1 mark]

_____

_____

(iv) State the resolution of the stopwatch used in the experiment in Section A. [1 mark]

_____

2 (a)(v)

Complete the table below to explain why the area of the cake case was controlled. [1 mark]

Controlled variable	Why was it controlled?
AREA OF CAKE CASE	

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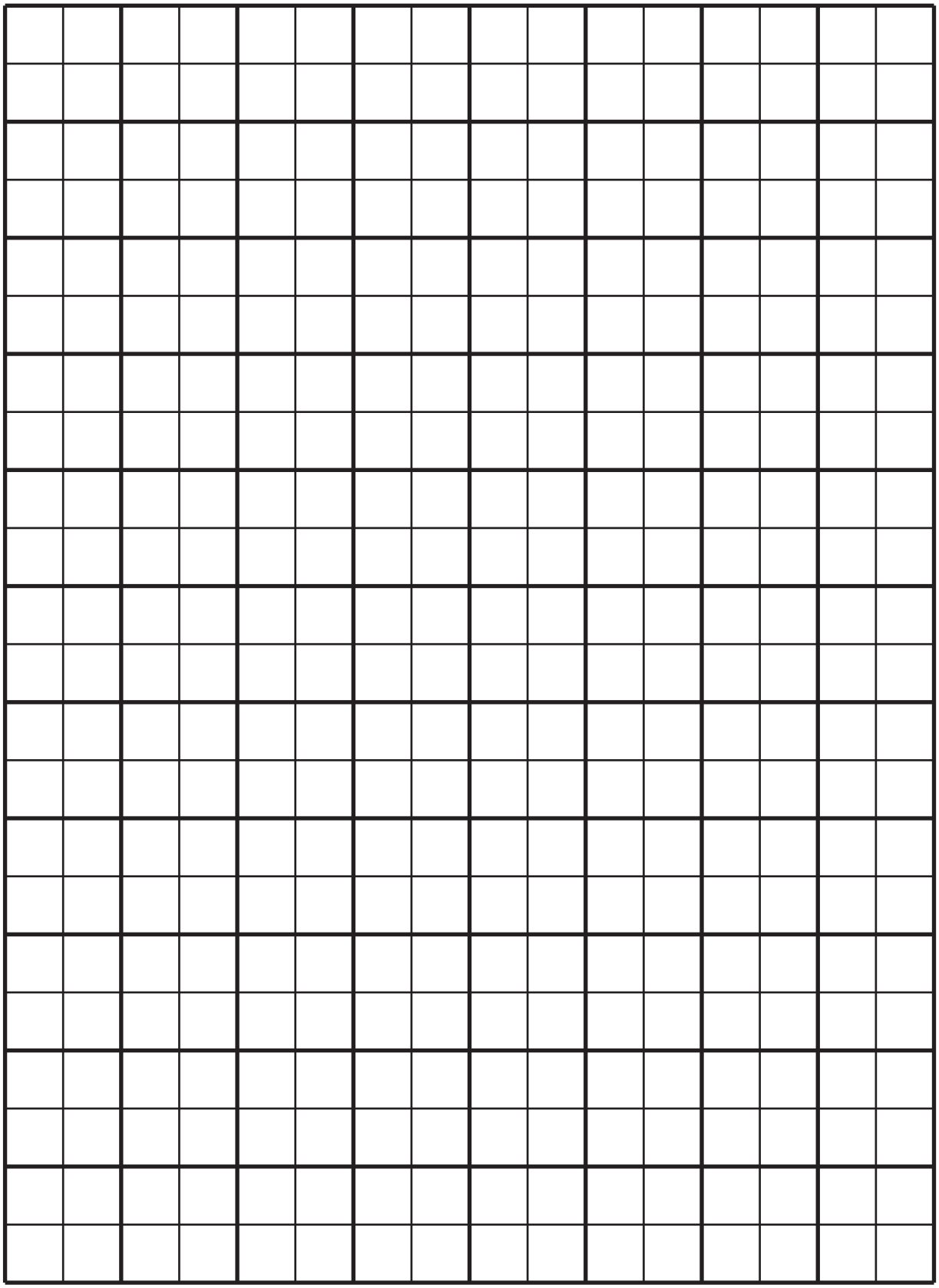

2 (b)(i) Use your results from Section A to draw a graph of time (vertical axis) against distance travelled (horizontal axis) on the grid on the opposite page. [5 marks]

(ii) Use your graph to describe the relationship between distance travelled and the time taken. [2 marks]

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Distance travelled (cm)	Mean time (s)	Speed (UNIT = _____)
150		
130		
110		
90		
70		
50		

2 (c) **Copy your results for mean time to fall from Section A into the table on the opposite page.**

(i) **Use the data in the table and the equation:**

$$\text{speed} = \frac{\text{distance travelled}}{\text{time}}$$

to calculate the speed of the cake case for each distance.
Record each speed in the table AND include a suitable unit. [3 marks]

Space for calculations.

2 (c)(ii)

William suggests that the cake case falls at terminal speed for each distance travelled. Explain whether your results support this. [2 marks]

2 (d)(i) **The uncertainty in the time for any given distance travelled is given by:**

$$\text{uncertainty} = \frac{\text{maximum time taken} - \text{minimum time taken}}{2}$$

Calculate the uncertainty in time for your results for 150 cm. [2 marks]

uncertainty = _____ s

2 (d)(ii)

One inaccuracy in this experiment is starting the stopwatch as the cake case passes the pointer.
Suggest TWO improvements which would reduce this inaccuracy. [2 marks]

Improvement 1

Improvement 2

2 (d)(iii)

Explain whether your data for 150 cm is repeatable. [2 marks]

(iv) Explain how you could assess the reproducibility of your results. [1 mark]

24

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