



GCSE

MONDAY, 8 JANUARY – FRIDAY, 9 FEBRUARY 2024

BIOLOGY – Unit 3 (3400U30)

PRACTICAL ASSESSMENT

**INVESTIGATING THE EFFECT OF TEMPERATURE
ON CELL MEMBRANES**

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.

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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]

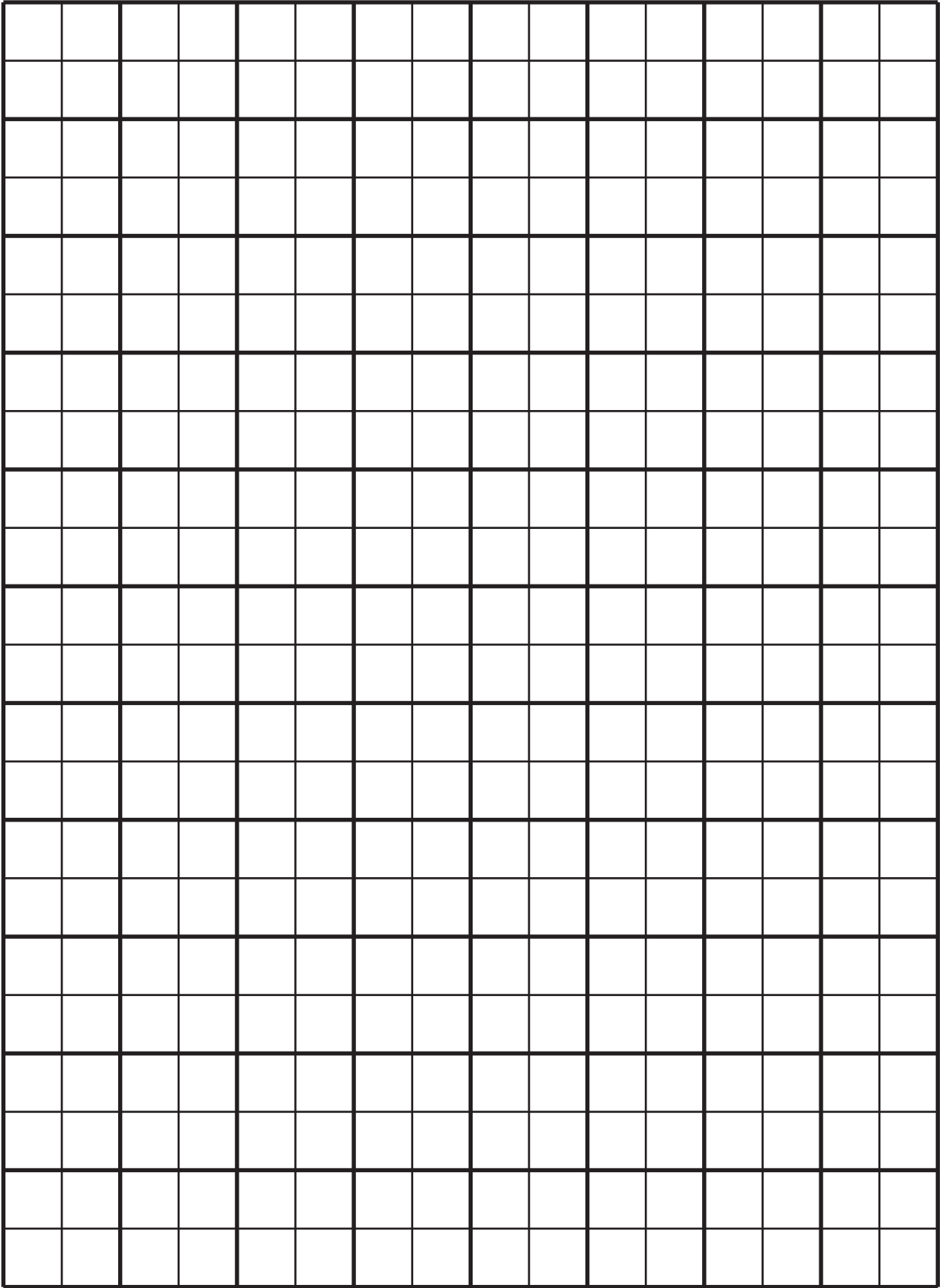
(ii) State the range of the independent variable. [1 mark]

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

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2 (b) Use your results from Section A to draw a graph of betalain concentration (vertical axis) against temperature (horizontal axis) on the grid opposite. Include a plot at (0,0). [5 marks]

(c)(i) Use your graph to describe the relationship between temperature and betalain concentration in the water. [1 mark]

(ii) Suggest a value for the concentration of betalain in the water at 35°C. SHOW ON YOUR GRAPH how you arrived at this result. [2 marks]

concentration of betalain = _____ $\mu\text{g/g}$

- 2 (d) State what is meant by a random error.
Suggest how the effect of random errors may
be reduced. [2 marks]**

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Source of inaccuracy	Improvement

2 (e) Complete the table on the opposite page by stating TWO sources of inaccuracy and suggest an improvement for each. [4 marks]

(f) When you trim the beetroot cylinders, the betalain begins to leak out straight away. Use your knowledge of plant cell structure to suggest where the betalain must be located AND explain why the betalain leaks out. [3 marks]

- 2 (g) Plan an experiment to investigate how the surface area of the beetroot could affect how much betalain leaks out into the water. Include a prediction in your answer. You do not need to carry out this experiment. [4 marks]**

[illegible]

Question number	Additional page, if required. Write the question numbers in the left-hand margin.

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