Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

S24-3445U50-1D

MONDAY, 8 JANUARY – FRIDAY, 9 FEBRUARY 2024

APPLIED SCIENCE (Double Award) – Unit 5 (3445U50)

PRACTICAL ASSESSMENT

INVESTIGATING THE VITAMIN C CONTENT OF FRUIT JUICES

SECTION B

1 hour

3445U501D
01

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

ADDITIONAL MATERIALS

A calculator and your Section **A** exam paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) 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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SECTION B

Answer **all** questions.

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

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

.....

(iii) State **two** control variables in this experiment **and** how they were controlled. [4]

Control variable	How it was controlled

(iv) State the resolution of the syringe used in this experiment. [1]

.....

(b) A student carried out an experiment to determine how many drops of known concentrations of vitamin C solution were needed to decolourise 1 cm^3 of a 0.01% solution of DCPIP.

The results are shown below.

Concentration of vitamin C solution (mg/cm^3)	Number of drops needed to decolourise DCPIP
0.10	14
0.20	7
0.30	5
0.40	3
0.50	2

(i) Use the results obtained by the student above to draw a graph of number of drops needed to decolourise DCPIP (vertical axis) against concentration of vitamin C solution (horizontal axis) on the grid opposite. [5]

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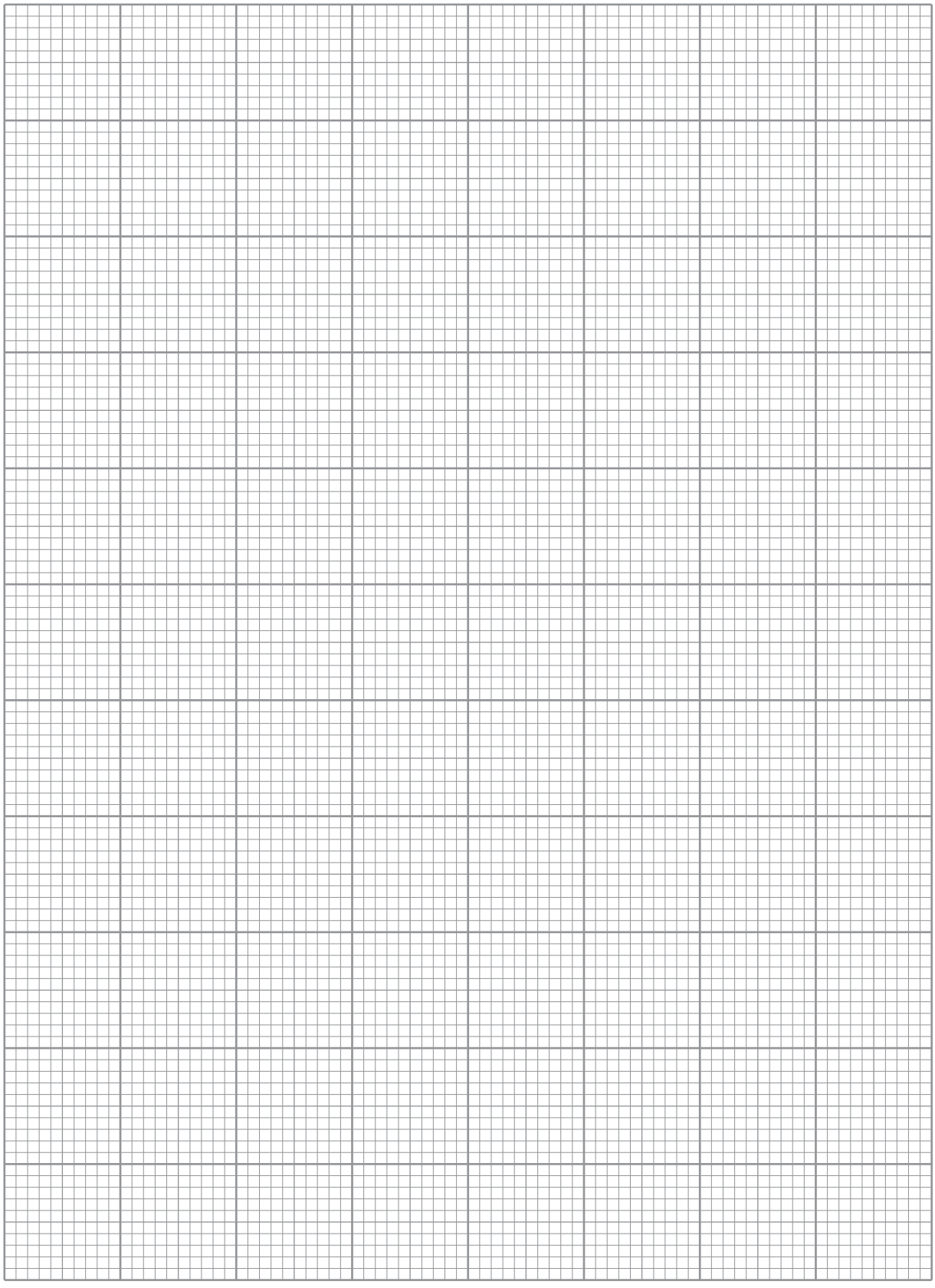

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(ii) The student carried out a similar experiment to the one you carried out in Section **A** to investigate the vitamin C content of the same fruit juices. Their results are shown in the table below.

Type of juice	Number of drops needed to decolourise DCPIP				Concentration of vitamin C mg / cm^3
	Trial 1	Trial 2	Trial 3	Mean	
orange	7	6	6	6	.....
pineapple	55	54	53	54	0.03
grapefruit	7	3	6	5	0.30

Use the graph drawn in part (b)(i) and the table above to calculate the concentration of vitamin C in the orange juice tested by the student.
Write your answer in the table. [1]

(c) Before carrying out the experiment, the student put forward the following hypothesis, 'Orange juice contains more vitamin C per cm^3 than pineapple and grapefruit juice.'

(i) State whether the results in part (b)(ii) support this hypothesis.
Use data from the table to explain your answer. [2]

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(ii) Evaluate the repeatability of the data the student obtained in part (b)(ii). [2]

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(iii) State why it is not possible to comment on the reproducibility of this experiment. [1]

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(d) Suggest **two** inaccuracies that may have affected the validity of the results you obtained **and** suggest how each could be overcome. [4]

Inaccuracy	Improvement

(e) The recommended daily allowance (RDA) of vitamin C is 40 mg.
In another experiment a student calculated that 1 cm^3 of apple juice contained 0.84 mg of vitamin C.
Calculate the volume of apple juice the student would need to drink to reach their RDA of vitamin C. [2]
Space for calculation.

volume = ... cm^3

24

END OF PAPER

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

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