Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **October/November 2018**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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1 Fruit juice can be produced by crushing and squeezing fresh fruit. The juice produced in this way is often cloudy.

The enzyme pectinase is used to produce clear fruit juice. This process is called clarification.

Fig. 1.1 shows fruit juice before and after clarification.

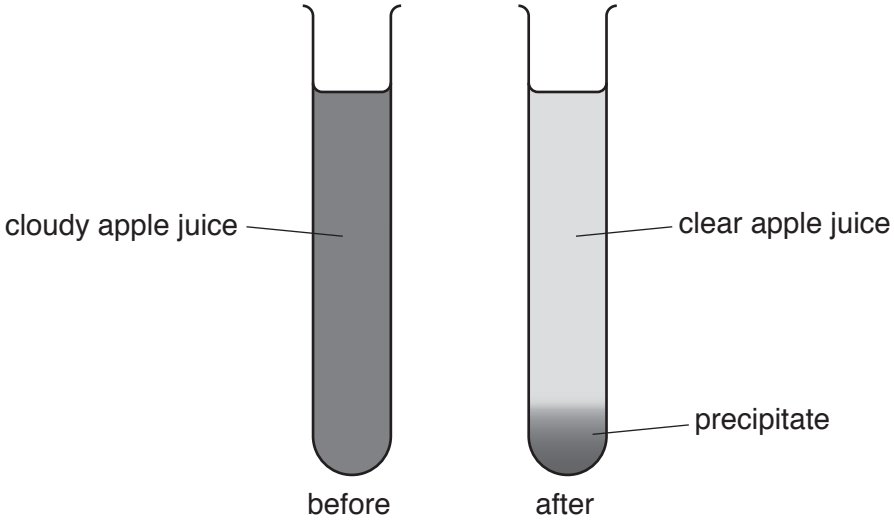

Fig. 1.1

A student investigated the effect of pectinase concentration on the clarification of apple juice.

The student was provided with freshly prepared apple juice, water and a 5% pectinase solution.

Step 1 Four test-tubes were labelled **P1**, **P2**, **P3** and **P4**.

Step 2 Syringes were used to add the volumes of water and 5% pectinase solution shown in Table 1.1 to each of the test-tubes.

Table 1.1

test-tube	volume of water /cm^3	volume of 5% pectinase solution /cm^3	final percentage concentration of pectinase solution
P1	0.00	1.00	5.0
P2	0.50	0.50	2.5
P3	0.75	0.25	
P4	1.00	0.00	0.0

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(a) Calculate the final concentration of the pectinase solution in test-tube **P3**.

View solution

Show your working and write your answer, to one decimal place, in Table 1.1.

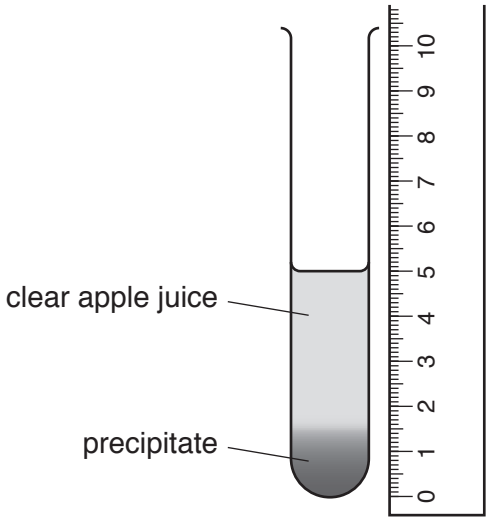
[2]

Step 3 5 cm^3 of apple juice was added to each of test-tubes **P1**, **P2**, **P3** and **P4**.

Step 4 The contents of each test-tube were carefully mixed using a glass rod.

Step 5 A stop-clock was immediately started.

Step 6 After five minutes, the height of the precipitate formed was measured using a ruler, as shown in Fig. 1.2. If no precipitate had formed in the test-tube, it was recorded as '0'.



not to scale

Fig. 1.2

Care was taken not to shake the test-tubes.

Step 7 After a further five minutes, the student repeated the measurement of the precipitates in the test-tubes.

Fig. 1.3 shows the test-tubes at 0, 5 and 10 minutes.

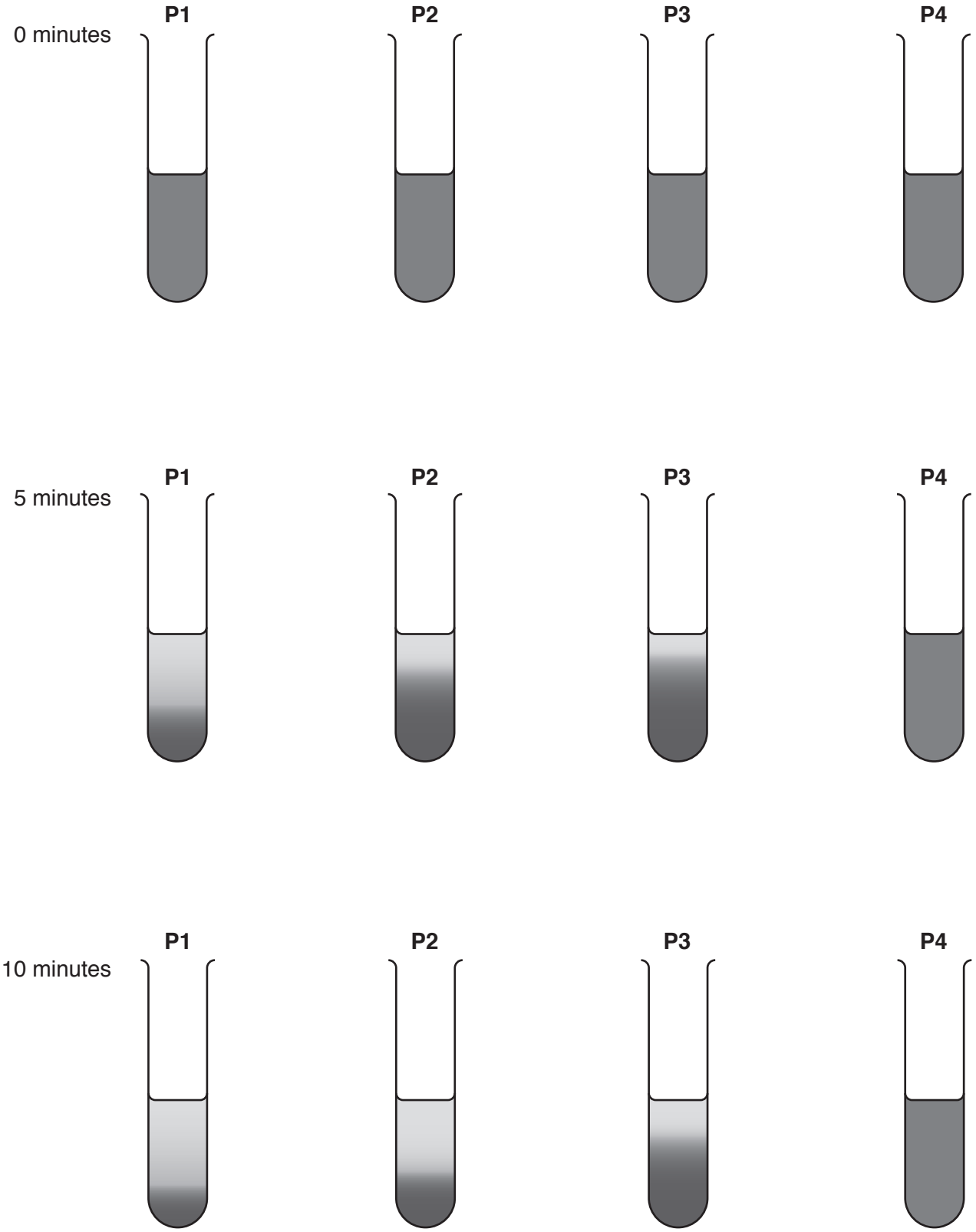


Fig. 1.3

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(b) Prepare a table to record the results.

View solution

Measure the height of the precipitate in each test-tube in Fig. 1.3.

Record the measurements in your table.

[4]

(c) State a conclusion for the results.

View solution

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.....[2]

(d) **(i)** State the variable that was changed (independent variable) in this investigation.

.....[1]

(ii) State **two** variables that should have been kept constant in this investigation.

View solution

1 .....

2 .....

[2]

(iii) Identify **one** possible error in step 6 and suggest an improvement.

error .....

.....

improvement .....

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[2]

(e) Explain the purpose of test-tube **P4**.

View solution

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.....[2]

(f) A student stated the hypothesis:

View solution

"Treating fruit juice with pectinase reduces the vitamin C content of the fruit juice".

Plan an investigation to test this hypothesis.

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.....[6]

(g) Fig. 1.4 shows a cross-section of a tomato fruit.

View solution



Fig. 1.4

Make a large drawing of the cross-section of tomato fruit.

[4]

(h) A student wanted to find out if tomatoes contained starch.

View solution

State the result you would expect for a positive test for starch.

.....[1]

[Total: 26]

2 A student investigated the number of petals on the flowers of two species of daisy, species **A** and species **B**.

View solution

(a) Fig. 2.1 shows one daisy flower of species **A**.



Fig. 2.1

The actual length of petal **XY** of the daisy in Fig. 2.1 was measured by the student as 5 mm.

Measure the length of petal **XY** on Fig. 2.1. Include the units.

length of **XY** on Fig. 2.1 .....

Use the formula to calculate the magnification of the photograph.

$$\text{magnification} = \frac{\text{length of } \mathbf{XY} \text{ on Fig. 2.1}}{\text{actual length of petal } \mathbf{XY}}$$

Show your working.

.....

[2]

The student collected 10 flowers from species **A** and 10 flowers from species **B**. They counted the number of petals on each flower.

Fig. 2.2 shows some of the daisy flowers of species **A**.



Fig. 2.2

(b) (i) Count the number of petals on flowers **9** and **10** in Fig. 2.2 and record the number of petals in Table 2.1.

View solution

Table 2.1

	number of petals	
flower number	species **A**	species **B**
1	16	7
2	15	5
3	13	5
4	20	6
5	20	6
6	15	7
7	17	5
8	15	6
9		6
10		5
average number of petals	17	

[1]

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(ii) Calculate the average number of petals for species **B**.

Write your answer in Table 2.1. Give your answer to the nearest whole number.

Space for working.

[1]

(iii) Suggest one method that could be used to ensure that the counting of the number of petals is accurate.

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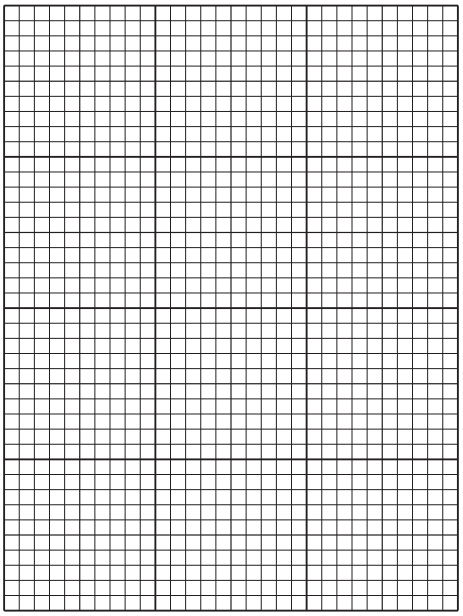
.....[1]

(c) Plot a bar chart on the grid of the average number of petals for species **A** and species **B** from Table 2.1.

View solution



[3]

(d) State **two** reasons why the student should have repeated the investigation.

View solution

1 .....

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2 .....

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[2]

(e) The student noticed that insects fed on the nectar produced by the flowers.

View solution

(i) Describe the test that the student would use to find out if the nectar contains reducing sugars.

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.....[3]

(ii) State **one** safety precaution that should be taken when carrying out the test for reducing sugars.

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.....[1]

[Total: 14]

View solution

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