Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/53**

Paper 5 Practical Test **October/November 2018**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

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.

For Examiner's Use	
1	
2	
Total	

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

This document consists of **9** printed pages and **3** blank pages.

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1 Catalase is an enzyme found in plant and animal cells. It catalyses the break down of hydrogen peroxide to form water and oxygen.

$$2H_2O_2 \longrightarrow 2H_2O + O_2$$

hydrogen peroxide — water — oxygen

The oxygen produced during the reaction forms a foam on the surface of the mixture of hydrogen peroxide and catalase. The height of the foam can be used as a measure of the activity of the catalase present.

You are going to investigate the effect of cooking on the activity of catalase in potato tissue.

Read all the instructions but DO NOT CARRY THEM OUT until you have drawn a table for your results in the space provided in 1(a)(i).

You should wear the gloves and eye protection provided during the practical work in question 1.

Step 1 Label one large test-tube **C** and the other large test-tube **U**.

Step 2 You are provided with two potato sticks, place them on the white tile. Cut each potato stick to exactly 4 cm in length.

Step 3 Cut one potato stick into four, 1 cm long, pieces as shown in Fig. 1.1. Repeat this with the other potato stick.

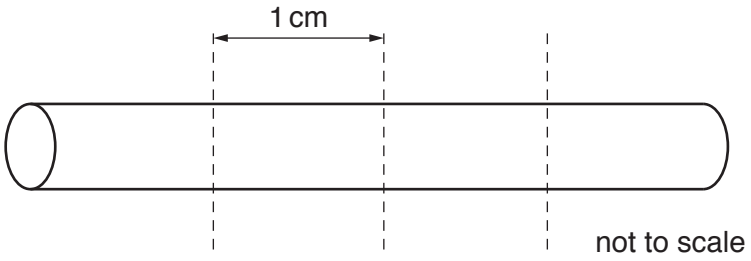

Fig. 1.1

Step 4 Raise your hand when you are ready for hot water to be added to the beaker labelled **hot water**.

Step 5 Place four of the 1 cm pieces of potato into the **hot water**. Leave them in the hot water for five minutes.

While you are waiting continue with the other questions.

Step 6 After five minutes use forceps to carefully remove the four cooked potato pieces from the **hot water** and put them into the large test-tube labelled **C**.

Step 7 Put the remaining four uncooked potato pieces into the large test-tube labelled **U**.

Step 8 Use the syringe to put 15 cm^3 of hydrogen peroxide solution into each of the large test-tubes. Leave them for three minutes.

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Step 9 After three minutes place the ruler against the outside of each of the large test-tubes and measure the height of the foam produced in each large test-tube. Think about how you will do this so that the height measured can be compared between the two test-tubes.

Record these measurements in your table in **1(a)(i)**.

(a) (i) Prepare a table to record your results.

View solution

[4]

(ii) Describe how you made sure that your measurements of the height of the foam in each large test-tube could be compared.

.....

.....

.....[1]

(iii) State a conclusion for these results.

.....

.....

.....[1]

(b) (i) Identify the variable that was changed (independent variable) in this investigation.

.....[1]

(ii) State **three** variables, other than the way in which you measured the height of the foam, that should have been kept constant in the investigation.

1 .....

2 .....

3 .....

[3]

(c) Identify **three** sources of error in this method.

View solution

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(d) A student was asked to test the hypothesis:

View solution

Catalase activity is the same in all species of plants.

Plan an investigation to test this hypothesis.

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.....

.....[6]

(e) Potatoes contain a lot of starch. When potatoes start to grow to form new plants, the starch is broken down by the enzyme amylase to form reducing sugars.

Explain how you could test samples of potato to show that starch and reducing sugars are present.

starch .....

.....

.....

reducing sugars .....

.....

.....

.....

[5]

[Total: 24]

View solution

2 Woodlice are small animals.

The rate of respiration of a woodlouse can be measured using a simple respirometer as shown in Fig. 2.1.

As the woodlouse respires the drop of coloured liquid moves along the capillary tube.

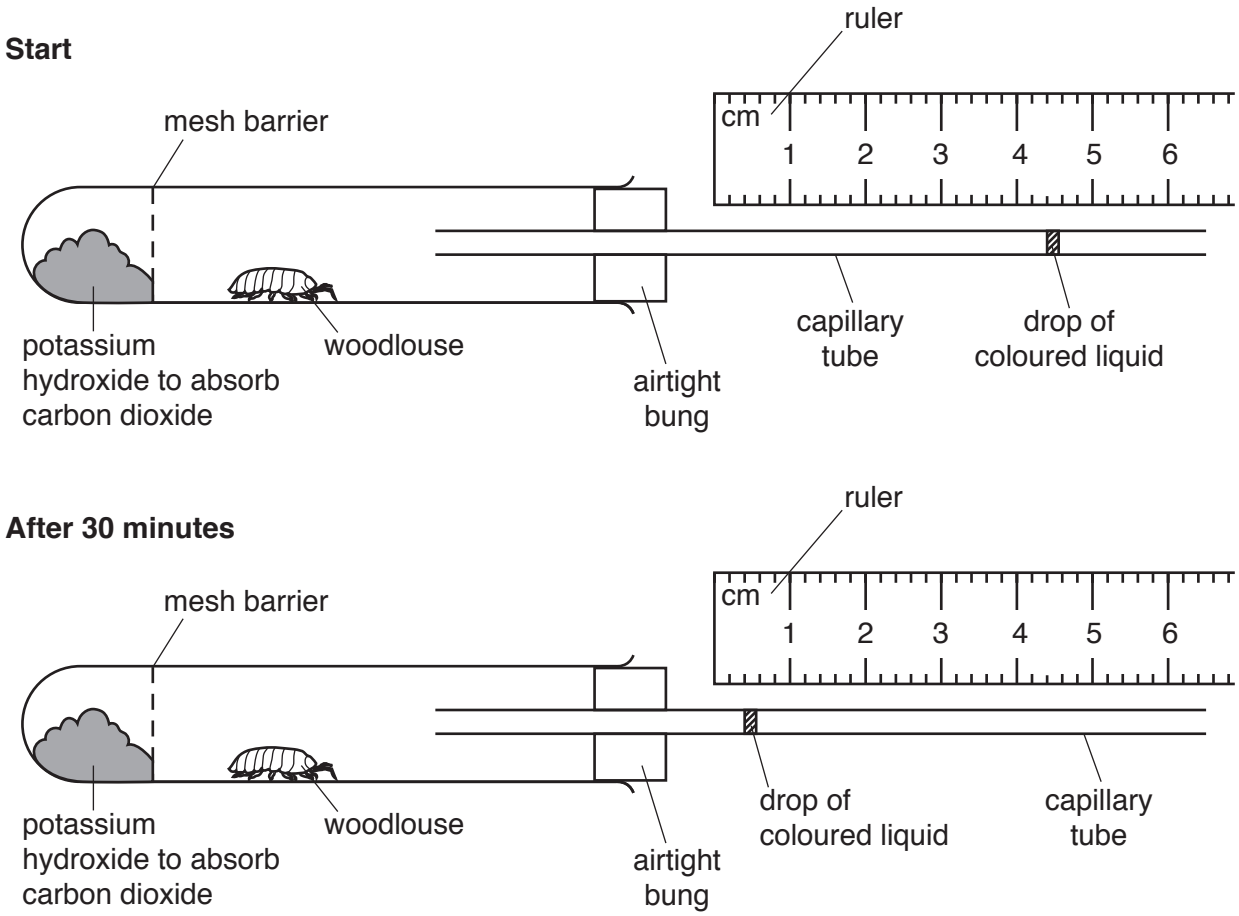


Fig. 2.1

View solution

(a) (i) Record the position of the drop of coloured liquid in the capillary tube shown in Fig. 2.1 at the **start** and **after 30 minutes**.

Start .....mm

After 30 minutes .....mm

[1]

(ii) Using the information in **2(a)(i)**, calculate the rate of movement of the drop of coloured liquid in mm per minute. Give your answer to one decimal place.

View solution

Space for working.

.....mm per minute

[2]

(b) The rate of movement of the drop of coloured liquid along the respirometer can be used as a measure of the rate of respiration. A student used the apparatus shown in Fig. 2.1 to investigate the rate of respiration in different species of small animals.

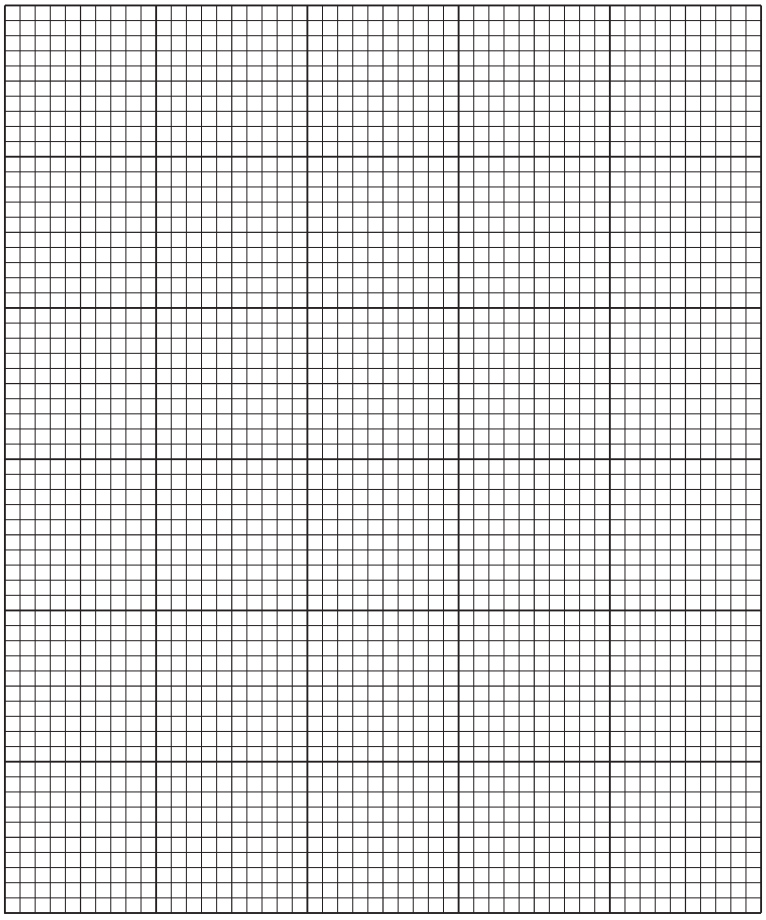
View solution

The results are shown in Table 2.1.

Table 2.1

animal species	rate of movement of drop of coloured liquid / mm per minute			
	repeat 1	repeat 2	repeat 3	average
A	1.6	1.7	1.3	1.5
B	0.9	1.0	0.7	0.9
C	2.4	2.6	2.5	2.5
D	1.9	2.0	1.9	1.9

(i) Plot a bar chart on the grid to show the average rate of movement of the drop of coloured liquid in the capillary tube for the four different species of animal.



[3]

(ii) State which letter represents the animal species with the highest rate of respiration.

.....[1]

(iii) The student decided it would be better to calculate the rate of respiration per gram of animal so that the values could be compared.

Describe how the student could find out the rate of respiration per gram of animal.

.....

.....

.....

.....[2]

(c) Fig. 2.2 shows a photograph of a woodlouse.

View solution

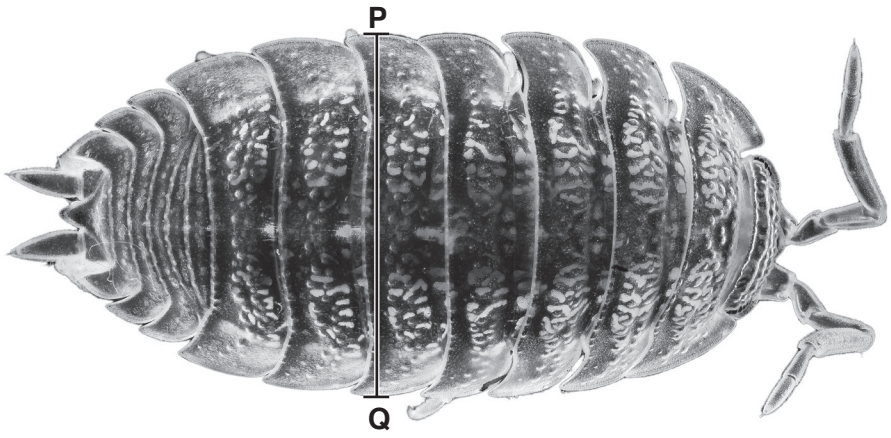


Fig. 2.2

(i) Draw a large diagram of the woodlouse in Fig. 2.2.

[4]

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(ii) The magnification of the woodlouse in Fig. 2.2 is ×9.

View solution

Measure the width of the woodlouse along line **PQ**. Include the unit.

length of line **PQ** .....

Calculate the actual width of the woodlouse using the formula. Include the unit.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ} \text{ on Fig. 2.2}}{\text{actual width of woodlouse}}$$

Show your working and give your answer to **two** decimal places.

.....
[3]

[Total: 16]

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