Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/52**

Paper 5 Practical Test **October/November 2019**

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 regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **10** printed pages and **2** blank pages.

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1 You will investigate the effect of the enzyme amylase (**A**) on the breakdown of starch (**S**). The starch suspension **S** will be placed inside a bag made from dialysis tubing.

$$\text{starch} \xrightarrow{\text{amylase}} \text{reducing sugars}$$

Dialysis tubing is made from a type of membrane that is partially permeable. Only small molecules can pass through this membrane.

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).

You should use the gloves and eye protection provided while you are carrying out the practical work.

You are supplied with two dialysis tubing bags, amylase solution **A** and starch suspension **S**.

Step 1 Label two large test-tubes, **E** and **W**, and place them in a test-tube rack.

Step 2 Use a syringe to put 20 cm^3 of distilled water into each of the labelled test-tubes.

Step 3 Use a syringe to draw up 3 cm^3 of starch suspension **S**.

Step 4 Use another syringe to draw up 3 cm^3 of amylase solution **A**.

Step 5 One end of each of the pieces of dialysis tubing has been knotted to form a bag. Open the **other** end of one of the dialysis tubing bags. You may need to rub the tubing between your fingers to open it.

Step 6 Put starch suspension **S** and amylase solution **A** from steps 3 and 4 into the open dialysis tubing bag.

Step 7 Rinse the outside of the dialysis tubing bag by dipping it into the **water for washing**. Keep the open end of the bag above the water.

Step 8 Carefully lower the dialysis tubing bag into the large test-tube labelled **E**. Fold the top of the bag over the outside of the test-tube. Use an elastic band to hold the dialysis tubing in place as shown in Fig. 1.1.

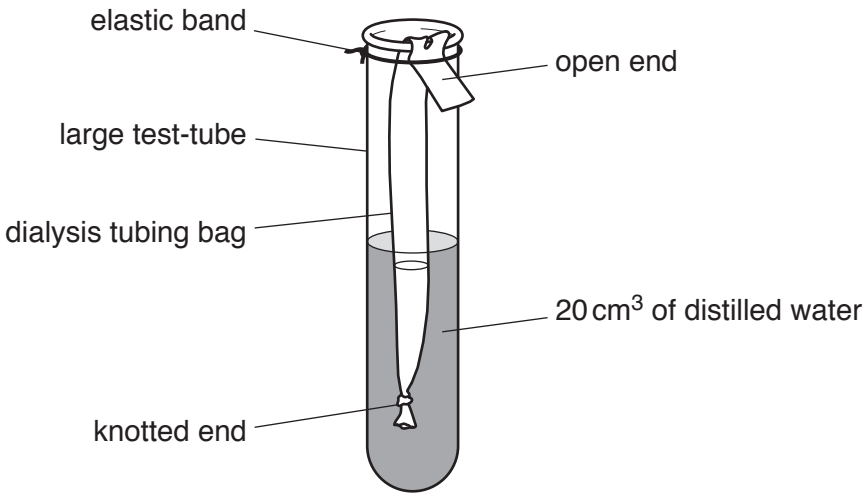

Fig. 1.1

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Step 9 Repeat steps 3 to 7, using 3 cm^3 of distilled water instead of amylase solution **A** in step 4.

Step 10 Carefully lower the dialysis tubing bag into the large test-tube labelled **W**. Fold the top of the dialysis tubing bag over the outside of the test-tube. Use an elastic band to hold the dialysis tubing in place as shown in Fig. 1.1.

Step 11 Prepare a water-bath by putting approximately 100 cm^3 of hot water into the beaker labelled **water-bath**. Raise your hand when you are ready for a supply of hot water for your water-bath.

Step 12 Put both large test-tubes into the water-bath and leave them for 10 minutes.

Continue with the other questions while you are waiting.

Step 13 After 10 minutes carefully remove the dialysis tubing bag from large test-tube **E** and pour the contents of the dialysis tubing bag into the beaker labelled **E2**.

Step 14 Carefully remove the dialysis tubing bag from large test-tube **W** and pour the contents of the dialysis tubing bag into the beaker labelled **W2**.

You are going to test the contents of the two large test-tubes (**E** and **W**) and the two beakers (**E2** and **W2**) for starch.

Step 15 Use a clean pipette to place a drop of the solution from large test-tube **E** onto a white tile and add one drop of iodine solution.

Record the colour in the table you have prepared in **1(a)**.

Step 16 Repeat step 15 using the solution from large test-tube **W**.

Step 17 Repeat step 15 using the solution from beaker **E2**.

Step 18 Repeat step 15 using the solution from beaker **W2**.

(a) Prepare a table to record the results of the tests for starch in the space provided.

View solution

[4]

(b) (i) Suggest why the dialysis tubing bag was rinsed in step 7.

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..... [1]

(ii) Explain why distilled water was used instead of amylase solution **A** in the dialysis tubing bag in test-tube **W**.

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..... [2]

(iii) State **two** variables that were kept constant during this investigation.

View solution

1 .....

2 .....

[2]

A student carried out the same investigation but also tested the solutions for reducing sugars.

(c) Describe how the student would find out if the solutions contained reducing sugars.

View solution

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..... [3]

(d) Plan an investigation **using dialysis tubing** to determine the effect of temperature on the activity of the enzyme amylase.

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..... [6]

(e) The student wanted to find out if the amylase enzyme passed through the dialysis tubing into the large test-tube. Amylase is made of protein.

Describe how the student could find out if the solution in the large test-tube contained protein.

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..... [2]

View solution  [Total: 20]

2 An investigation was performed to determine the effect of light intensity on leaf size in one species of plant.

Plants were grown in three different light intensities. The maximum width of each leaf was recorded. The results were recorded in Table 2.1 and an average value was calculated.

The results for three leaves grown in high light intensity are shown in Fig. 2.1. The horizontal line on each leaf indicates its maximum width.

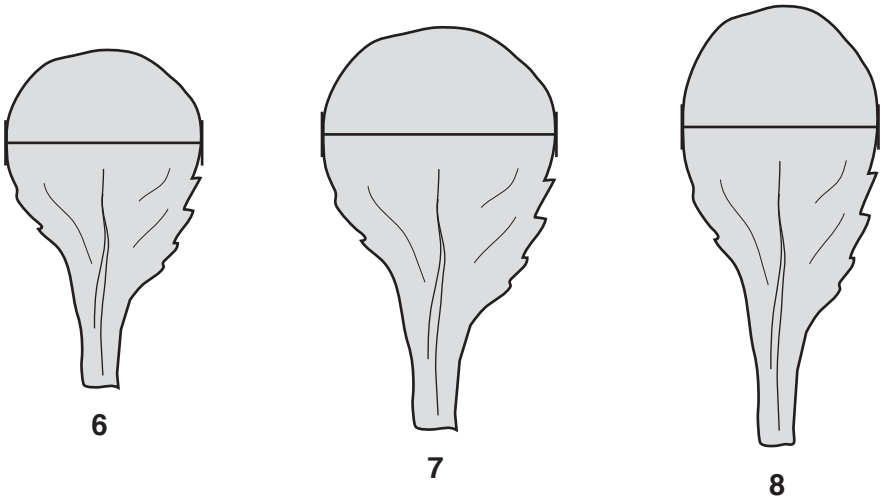

Fig. 2.1

(a) (i) Measure the maximum widths of leaves **6**, **7** and **8** in Fig. 2.1 and record these values in Table 2.1.

[1]

Table 2.1

leaf	maximum width of leaves / mm		
	low light intensity	medium light intensity	high light intensity
1	15	43	27
2	12	45	32
3	13	48	26
4	13	44	28
5	15	47	27
6	14	43	
7	12	12	
8	15	46	
average	14	41	

View solution

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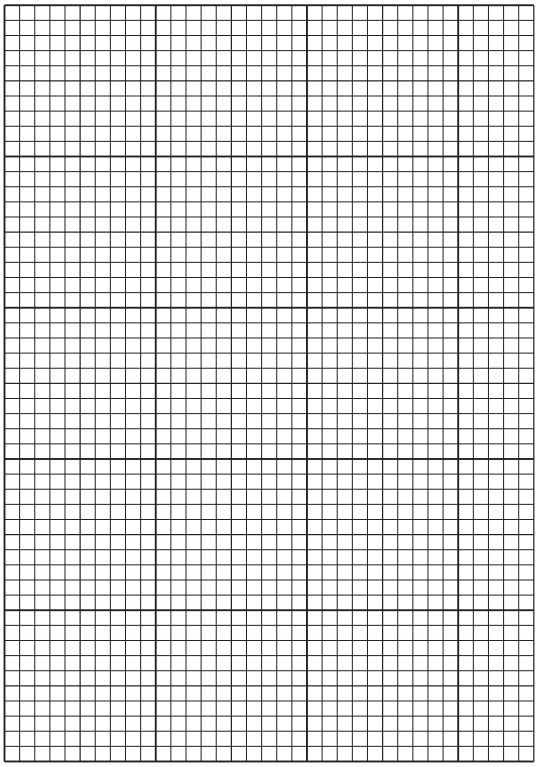
(ii) Calculate the average width of the leaves grown in a high light intensity in Table 2.1. Record this value in Table 2.1.

View solution

[1]

(iii) Plot a bar chart on the grid of the **average** leaf width for leaves grown in low, medium and high light intensity using the data in Table 2.1.

View solution



[3]

(iv) Circle **one** measurement in Table 2.1 that could be considered to be anomalous.

View solution

Give a reason for your choice.

reason .....

..... [2]

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

..... [1]

(ii) State the variable that was measured in this investigation (the dependent variable).

..... [1]

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(c) Fig. 2.2 is a photomicrograph of a cross-section of a root.

View solution

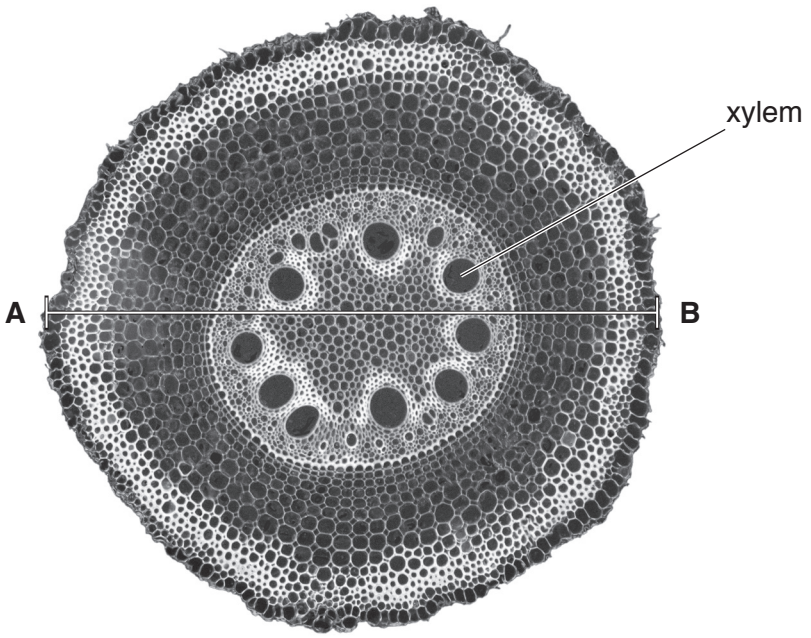

Fig. 2.2

(i) Make a large drawing of the cross-section of the root in Fig. 2.2 to show the different areas of the root.

Do **not** draw individual cells.

[4]

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(ii) Measure line **AB** on Fig. 2.2 in millimetres.

View solution

length of line **AB** ..... mm

The actual diameter of the root shown in Fig. 2.2 is 2 mm.

Calculate the magnification of Fig. 2.2 using the equation.

$$\text{magnification} = \frac{\text{length of line } \mathbf{AB} \text{ on Fig. 2.2}}{\text{actual diameter of the root}}$$

.....

[2]

(iii) Fig. 2.3 is a photomicrograph of a cross-section of a stem.

View solution

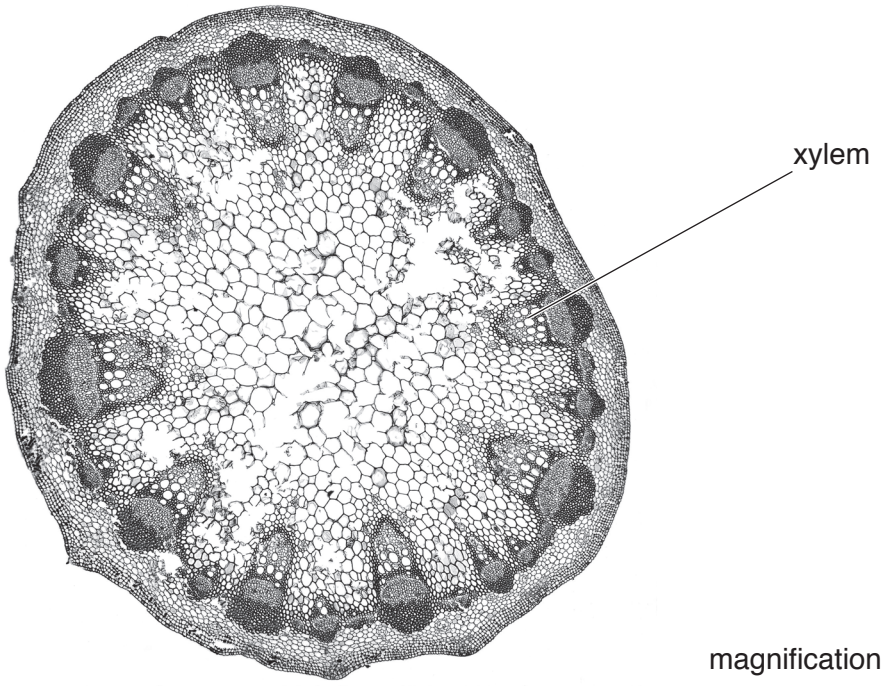

Fig. 2.3

State **two** differences between the root in Fig. 2.2 and the stem in Fig. 2.3.

1 .....

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2 .....

.....

[2]

(d) A student suggested that measuring leaf area is better than measuring leaf width.

View solution

(i) Describe how the area of a leaf could be measured.

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..... [2]

(ii) Suggest why measuring leaf area is better than measuring leaf width.

View solution

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..... [1]

[Total: 20]

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