Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

BIOLOGY **0610/52**

Paper 5 Practical Test **February/March 2016**

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	

The 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.

CAMBRIDGE International Examinations

[Turn over

1 You are going to investigate the effect of temperature on the activity of amylase.

Amylase is an enzyme that catalyses the break down of starch.

Starch changes the colour of iodine solution from orange-brown to blue-black.

You will measure the time taken for the iodine solution to stay orange-brown at two different temperatures.

Amylase can irritate the skin and damage the eyes. Use the eye protection and gloves provided.

Read through steps 1 to 11 **before** starting the experiment.

Step 1 Label a test-tube **W**, add 3 cm^3 of starch solution and place it into the beaker of warm water.

Step 2 Label a test-tube **C**, add 3 cm^3 of starch solution and place it into the beaker of iced water.

Step 3 Place one dropping pipette into each of test-tubes **W** and **C**.

Step 4 Use the marker pen to draw a line which divides the white spotting tile into two equal halves. Label one half **W** and the other half **C**.

Step 5 Put one drop of iodine solution into each of the wells of the spotting tile.

Step 6 Transfer one drop of the liquid in test-tube **W** to the first well in the half of the spotting tile labelled **W**. Observe any colour change.

Step 7 Transfer one drop of the liquid in test-tube **C** to the first well in the half of the spotting tile labelled **C**. Observe any colour change.

(a) State any colour changes observed in steps 6 and 7.

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.....[1]

Read through steps 8 to 11 and prepare a results table in part **1(b)**. **Do not start step 8 until you have drawn your results table.**

Step 8 Add 20 drops of amylase solution to each of test-tubes **W** and **C**, and stir gently.

Step 9 Start the timer.

Step 10 **Immediately**, transfer one drop of liquid from test-tube **W** to the second well in the half of the spotting tile labelled **W**. Return the remaining liquid in the pipette to test-tube **W** and then place the dropping pipette back into test-tube **W**. **Immediately**, transfer one drop of liquid from test-tube **C** to the second well in the half of the spotting tile labelled **C**. Return the remaining liquid in the pipette to test-tube **C** and then place the dropping pipette back into test-tube **C**.

Observe any colour changes and record your results in the table you prepared in part **1(b)**.

Step 11 Repeat step 10 after 2, 4, 6 and 8 minutes, using different wells in the spotting tile in each case. Record your observations in the table you prepared in part **1(b)**.

(b) Prepare a table to record your observations in the space below.

[6]

(c) Suggest reasons for using separate dropping pipettes for test-tubes **W** and **C**.

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.....[1]

(d) Explain your results for test-tube **W**.

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.....[3]

(e) Another student carried out the same investigation as you and they concluded:

"The higher the temperature, the greater the activity of amylase."

Do you agree with this conclusion?

Give a reason for your answer.

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.....[1]

(f) State **two** sources of error in the method used in your investigation.

Suggest how to improve the method to minimise these sources of error.

error 1 .....

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improvement 1 .....

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error 2 .....

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improvement 2 .....

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[4]

(g) Some students stated:

"The activity of amylase is greatest at 40°C."

Describe an investigation to test whether this statement is correct.

The investigation should be similar to that described in steps 1–11.

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.....[6]

(h) Amylase breaks starch down into reducing sugars.

Outline how the students could show that reducing sugars are present in a solution.

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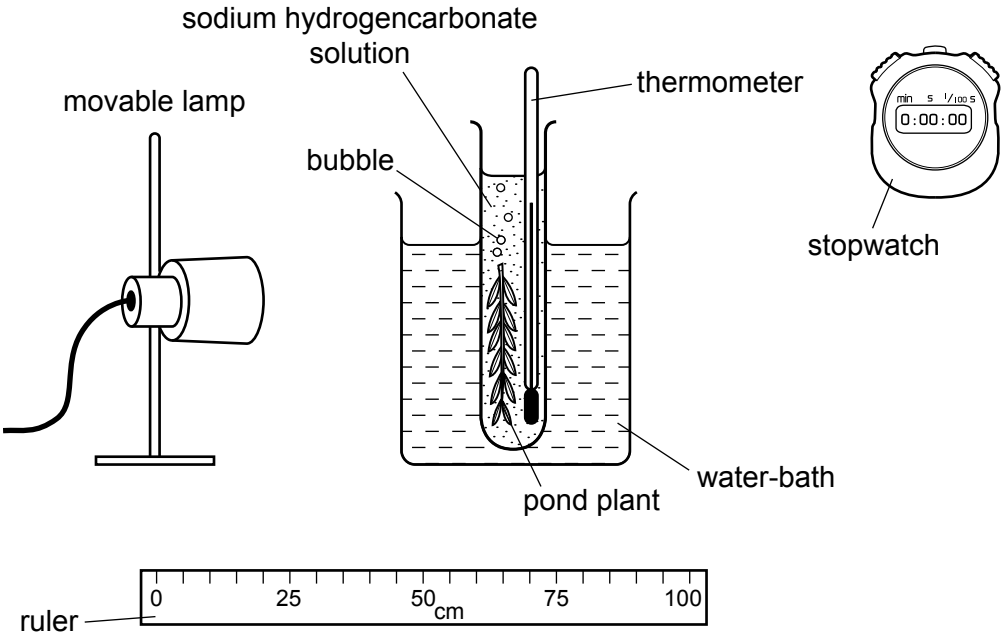
.....[2]

[Total: 24]

2 Leaves exposed to light photosynthesise and produce oxygen gas.

A student measured the rate at which the leaves of a pond plant produced bubbles of oxygen gas when exposed to different intensities of light.

The apparatus used is shown in Fig. 2.1.



not drawn to scale

Fig. 2.1

The investigation was carried out in a dark laboratory. The only light source was the lamp, as shown in Fig. 2.1.

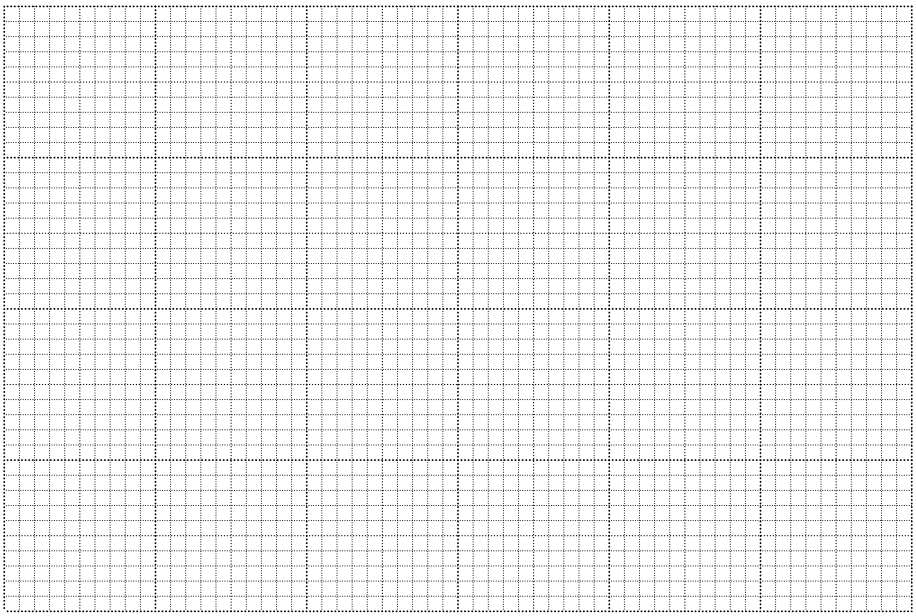
The student changed the light intensity by placing the lamp at different distances from the plant.

The results are shown in Table 2.1.

Table 2.1

distance of lamp from plant / cm	number of bubbles of oxygen produced per minute
20	29
40	16
60	8
80	3
100	1

(a) (i) Plot a graph of the data in Table 2.1 and draw a line of best fit.



[5]

(ii) Use your graph to estimate the distance of the lamp from the plant when six bubbles of oxygen per minute would be produced.

Show **on the graph** how you obtained your answer.

.....

[2]

(iii) Describe the relationship between light intensity and the rate at which oxygen is produced by the plant.

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.....[2]

(iv) Suggest why the student used a water-bath in the investigation shown in Fig. 2.1.

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.....[1]

(b) Fig. 2.2 shows a photograph of a section through the pond plant as seen under a light microscope.

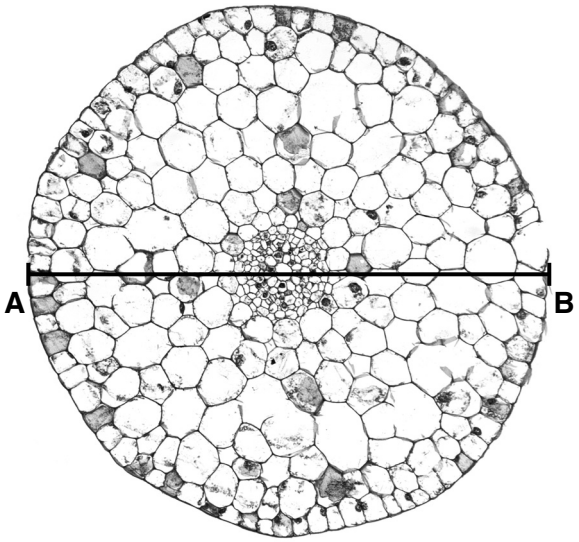

Fig. 2.2

(i) Make a large drawing of Fig. 2.2 to show the position of the outermost layer of cells and the central core.

Do **not** draw any of the individual cells or air spaces.

[3]

(ii) The central core is called the stele. Label the stele on your diagram. [1]

(iii) The diameter of the section in the photograph in Fig. 2.2 is shown by the line **AB**.

Measure the length of **AB** on Fig. 2.2.

Length of **AB** on Fig. 2.2 ..... mm

The actual diameter of the section is 7.5 mm.

The magnification of Fig. 2.2 can be calculated using the following equation:

$$\text{magnification} = \frac{\text{length of } \mathbf{AB}}{\text{actual diameter of the section}}$$

Calculate the magnification of Fig. 2.2 using the information above and your answer for **AB**.

Show your working.

Give your answer to the nearest whole number.

magnification ..... [2]

[Total: 16]

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