Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/52**

Paper 5 Practical Test **May/June 2015**

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 **10** printed pages and **2** blank pages.

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CAMBRIDGE International Examinations

[Turn over

Read through all the questions on this paper carefully before starting work.

1 Hydrogen peroxide is produced by metabolism in most cells and is toxic in high concentration. Cells contain the enzyme catalase to break down the hydrogen peroxide.
Fig. 1.1 shows this reaction.

$$\text{hydrogen peroxide} \xrightarrow{\text{catalase}} \text{water} + \text{oxygen}$$

Fig. 1.1

You are going to investigate the activity of catalase found in leaves. You will place two different sized pieces of leaf into hydrogen peroxide solution and record the time taken for them to rise to the surface of the solution.

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

[4]

You are provided with three flat bottomed containers (specimen tubes).

- Use a ruler to measure a distance of 40 mm from the bottom of each container and draw a line on the containers, as shown in Fig. 1.2.

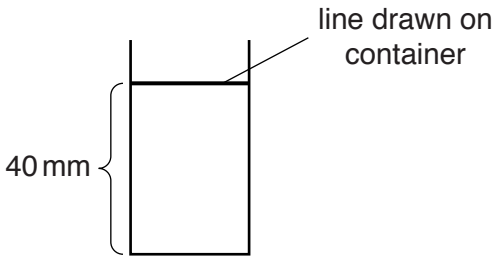

Fig. 1.2

You are provided with hydrogen peroxide solution in a container labelled **hydrogen peroxide**.

- Put on the eye protection provided.
- Use the syringe provided to put hydrogen peroxide solution into each container until it reaches the line at 40 mm.
- Use the ruler and scissors provided to cut **three** pieces of leaf. Each piece should measure 10 mm × 10 mm.
- Bend one of the pieces of wire provided into a U-shape. Place a piece of leaf into the U-shape and pinch the wire to hold the leaf in place as shown in Fig. 1.3.

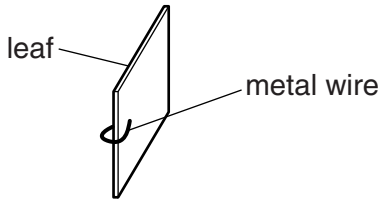

Fig. 1.3

- Add one piece of leaf and wire to the hydrogen peroxide solution in each of the containers. If it does not sink straight away, push the piece of leaf gently down with forceps.
- Observe the pieces of leaf and measure the time taken for each piece of leaf to rise from the bottom of the container to the surface of the hydrogen peroxide solution. Record the times in seconds in your table.
  The piece of leaf may sink after it reaches the surface. Make sure you record the time for the piece of leaf to **first** reach the surface.
- Using forceps, remove the pieces of leaf from the containers and place them in the container labelled **waste**. Keep the pieces of wire for the following steps.
- Cut another **three** pieces of leaf, 15 mm × 15 mm, and attach a piece of wire to each piece of leaf.
- Repeat the procedure of recording the time taken to reach the surface of the hydrogen peroxide solution for each of these 15 mm × 15 mm pieces of leaf.

(ii) Calculate the mean time taken for each size of leaf piece to reach the surface.
Show your working.

10 mm × 10 mm .....

15 mm × 15 mm .....[1]

(iii) Describe the effect of the size of leaf piece on the time taken to rise to the surface.

.....

.....

.....[1]

(b) **(i)** Describe your observations of the pieces of leaves as they rise to the surface.

.....

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.....

.....

.....[2]

(ii) Use the information you have been given and your observations to explain why the leaf pieces rose to the surface.

.....

.....

.....

.....

.....[2]

(c) Predict, with reasons, the effect of using a piece of leaf 20 mm × 20 mm on the time taken to rise to the surface.

.....

.....

.....

.....

.....[2]

(d) **(i)** State **one** variable that has been controlled in the investigation you have carried out.

.....[1]

(ii) State **one** source of error in the method used in this investigation.
Describe how to improve the method to decrease the effect of this error.

error .....

improvement .....

.....

.....
[2]

(iii) Describe a control experiment for this investigation.

.....

.....

.....

.....

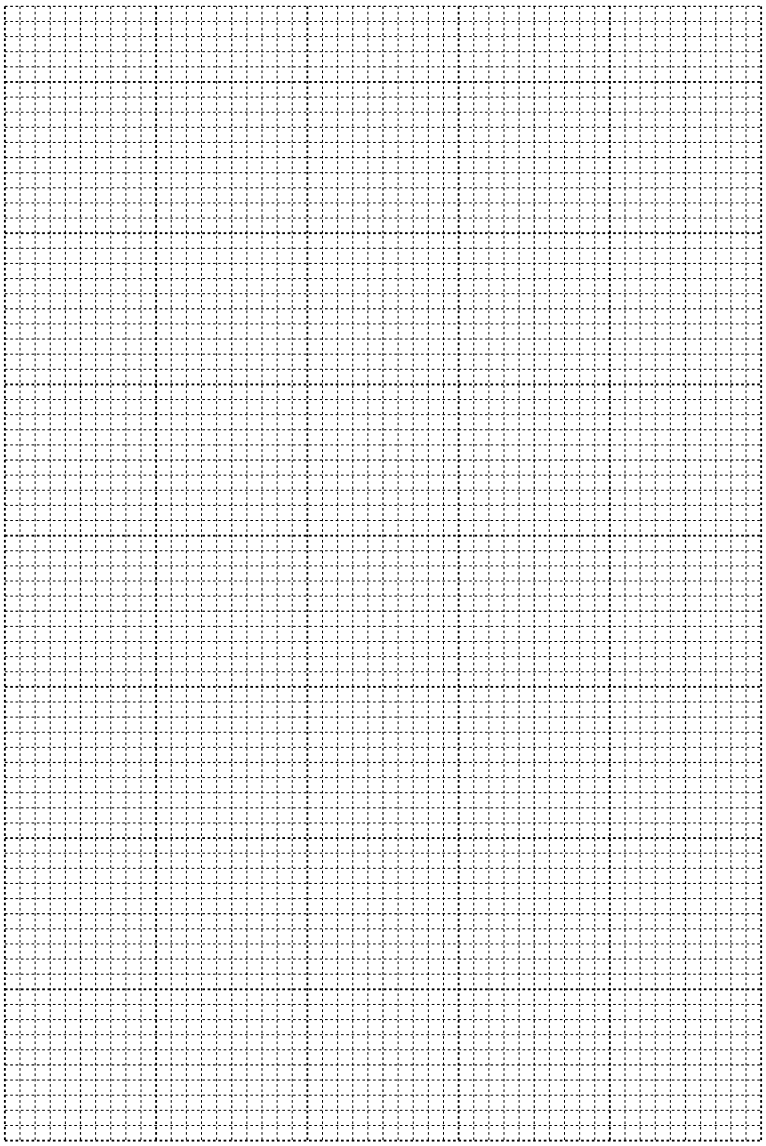
.....[2]

(e) Some students used the same method to investigate the catalase activity in pieces of leaf of four different species, **W**, **X**, **Y** and **Z**. Each piece of leaf was the same size.
Fig. 1.4 shows their results.

species	average time / s
W	290
X	130
Y	170
Z	50

Fig. 1.4

(i) Plot a bar chart of the data shown in Fig. 1.4.



[4]

(ii) Describe the results and suggest what the students could conclude from this investigation.

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.....[3]

[Total: 24]

2 Fig. 2.1 shows cells in the growing part of a root as seen using a microscope.

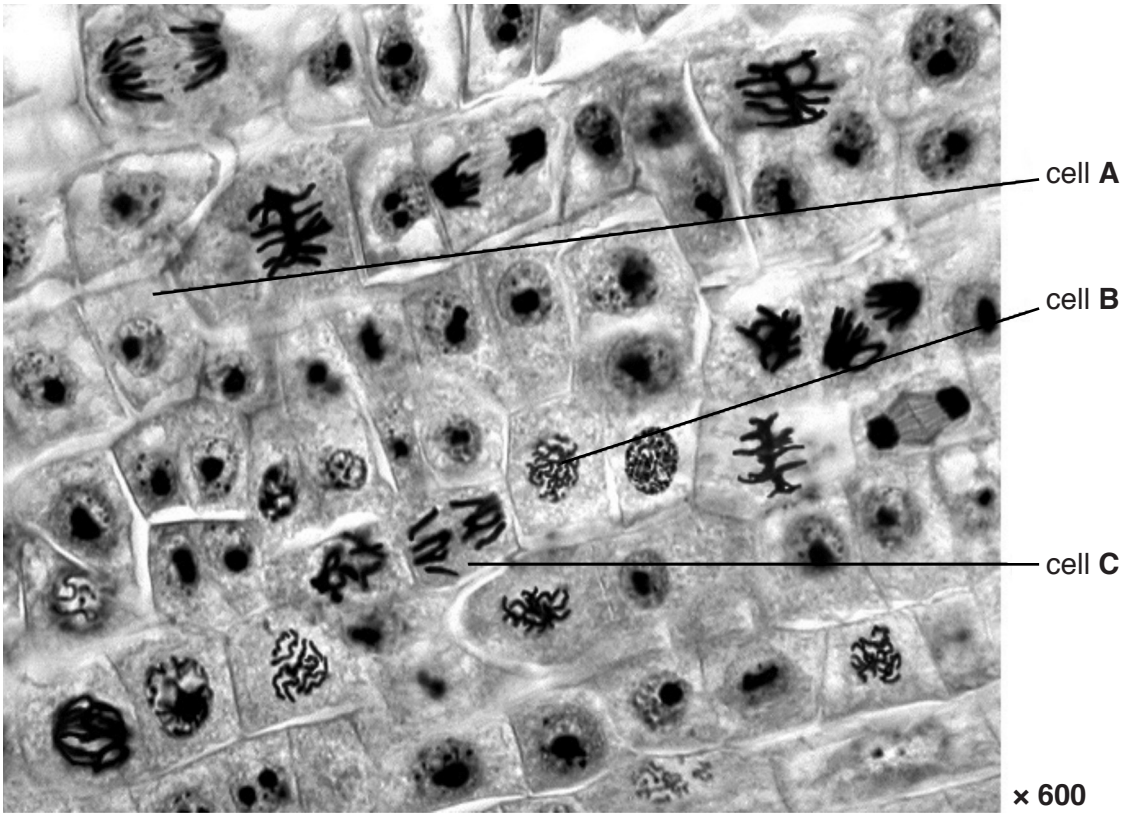

Fig. 2.1

(a) **(i)** Count and record the total number of cells in Fig. 2.1. Do **not** include any cells that are only partly visible.

.....[1]

(ii) Chromosomes can be seen in cells that are undergoing mitosis. There are 18 of these cells in Fig. 2.1.

Calculate the percentage of the cells that are undergoing mitosis in Fig. 2.1.
Show your working. Give your answer to the nearest whole number.

..... % [2]

(b) State **two** ways, visible in Fig. 2.1, in which the cell labelled **B** is different from the cell labelled **A**.

1 .....

.....

2 .....

.....
[2]

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(c) Fig. 2.2 is a magnified view of cell **C** in Fig. 2.1.

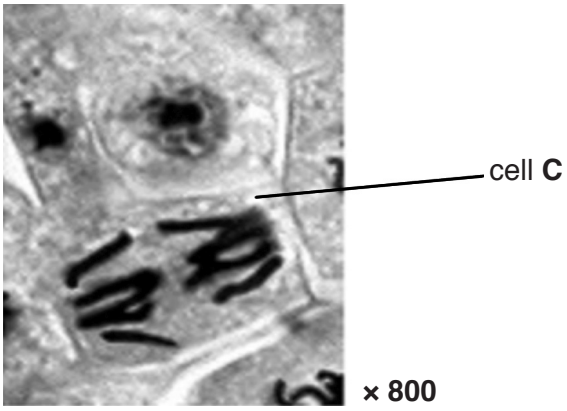

Fig. 2.2

(i) Make a large drawing of the cell labelled **C** to show:

- the cell wall
- the chromosomes.

Label a chromosome.

[5]

(ii) Measure the length of cell **C** in Fig. 2.2 and record your result. **Include the unit**.
Draw a line on Fig. 2.2 to show where you have made your measurement.

length of cell **C** .....[2]

(iii) Calculate the actual length of the cell.
Show your working. Give your answer to the nearest whole number.

size of cell .....mm [2]

(d) Cancer in the bronchus can be caused by smoking. When cancer develops, mitosis in cells becomes uncontrolled, forming tumours.
Fig. 2.3 shows cancer in the wall of a bronchus as seen using a microscope.

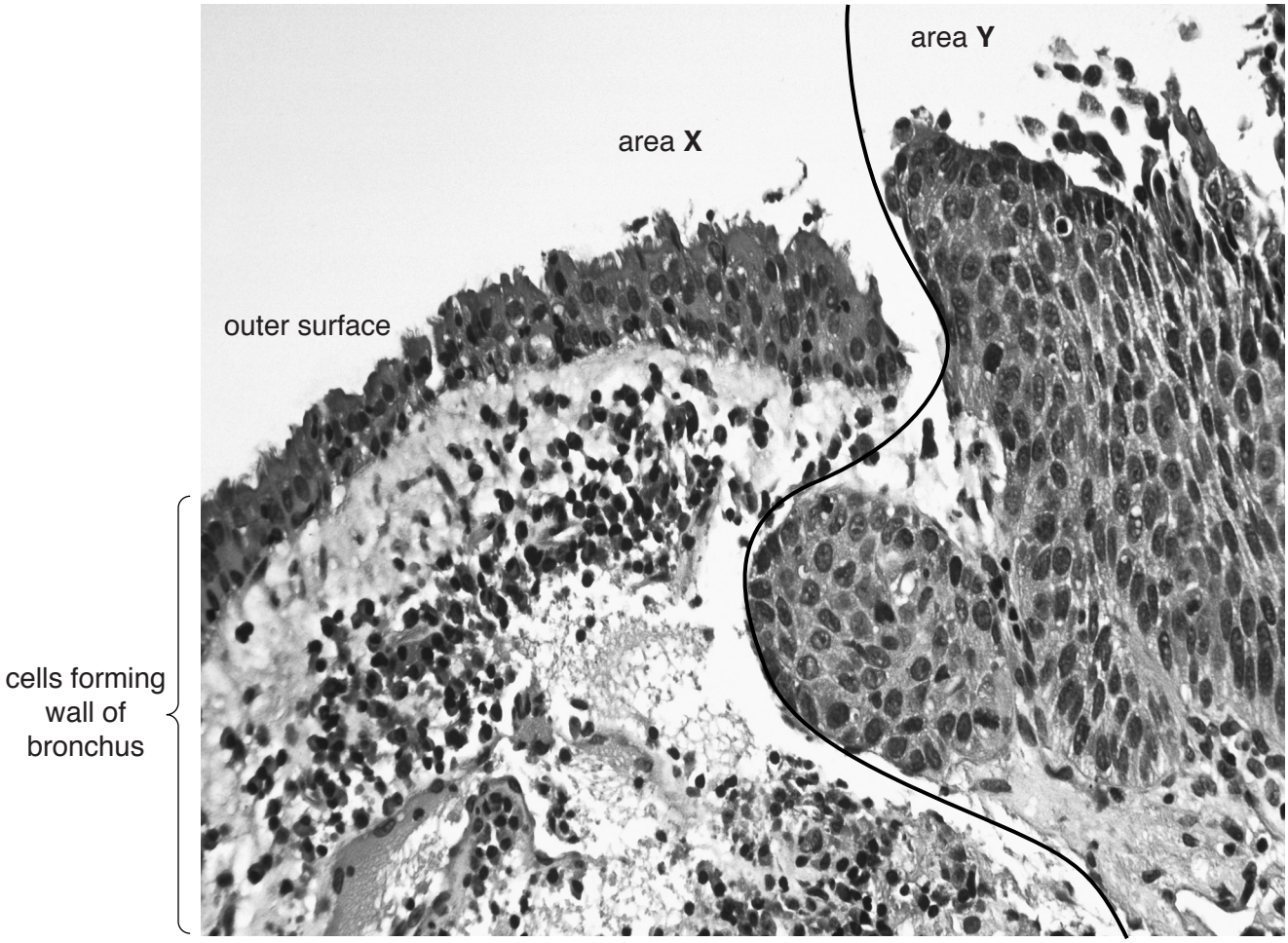

Fig. 2.3

Describe **two** features, visible in Fig. 2.3, that suggest that area **X** is healthy and area **Y** is cancerous.

1 .....

.....

.....

2 .....

.....

.....
[2]

[Total: 16]

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