UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

2235206891

BIOLOGY **9700/34**

Advanced Practical Skills 2 **May/June 2012**

2 hours

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 ink.
You may use a pencil for any diagrams, graphs or rough working.
Do **not** use red ink, staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

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

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You are reminded that you have **only one hour** for each question in the practical examination.

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You should:

- Read carefully through **the whole** of Question 1 and Question 2.
- Plan your use of **the time** to make sure that you finish all the work that you would like to do.

You will **gain marks** for recording your results according to the instructions.

1 Plant cells contain an enzyme, catalase, which catalyses the hydrolysis (breakdown) of hydrogen peroxide into oxygen and water. An extract of plant tissue contains catalase.

You are required to:

- make different concentrations of plant extract containing catalase
- investigate the effect of different concentrations of plant extract by finding the time taken for a square of filter paper, soaked in the plant extract, to rise in hydrogen peroxide solution.

You are provided with:

labelled	**contents**	**hazard**	**volume / cm^3**
H	hydrogen peroxide solution	harmful irritant	100
W	distilled water	none	80
P	100% plant extract solution	none	50

(a) (i) Decide on the concentrations of plant extract solution you will use in your investigation.

You will need to make up 10 cm^3 of each concentration of plant extract solution.

Prepare the space on page 3 to show:

- the concentration of **P**
- the volumes of **P**
- the volumes of **W**.

[3]

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Use this space:

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You are advised to read steps 1 to 10 before proceeding.

Proceed as follows:

1. Prepare the concentrations of plant extract solution as stated in **(a)(i)**.

2. Put **H** into the test-tube, filling to within 2 cm from the top.

3. Cut squares of filter paper, 1 cm × 1 cm.

4. Use forceps to pick up one square of filter paper and dip the whole square into one of the concentrations of plant extract solution in its container.

5. Wipe the square against the inside of the container to remove excess plant extract solution from both sides of the square.

6. Hold the square so that the top of the square is level with the surface of **H** as shown in Fig. 1.1.

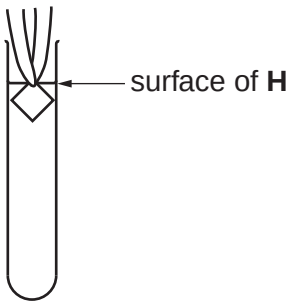


Fig. 1.1

7. Release the square (you may need to shake the forceps) and start timing.

8. Record the time taken for the square to return to the surface.
   If the time is more than three minutes, stop timing and record 'more than 180'.

9. Remove the square from the test-tube.

10. Repeat steps 4 to 9 with the other concentrations of plant extract.

(ii) Prepare the space below and record your results.

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[6]

(iii) Identify **three** significant sources of error in your investigation.

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..... [3]

(iv) Suggest how you would make **three** improvements to this investigation.

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..... [3]

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Catalase catalyses the hydrolysis of hydrogen peroxide into oxygen and water.

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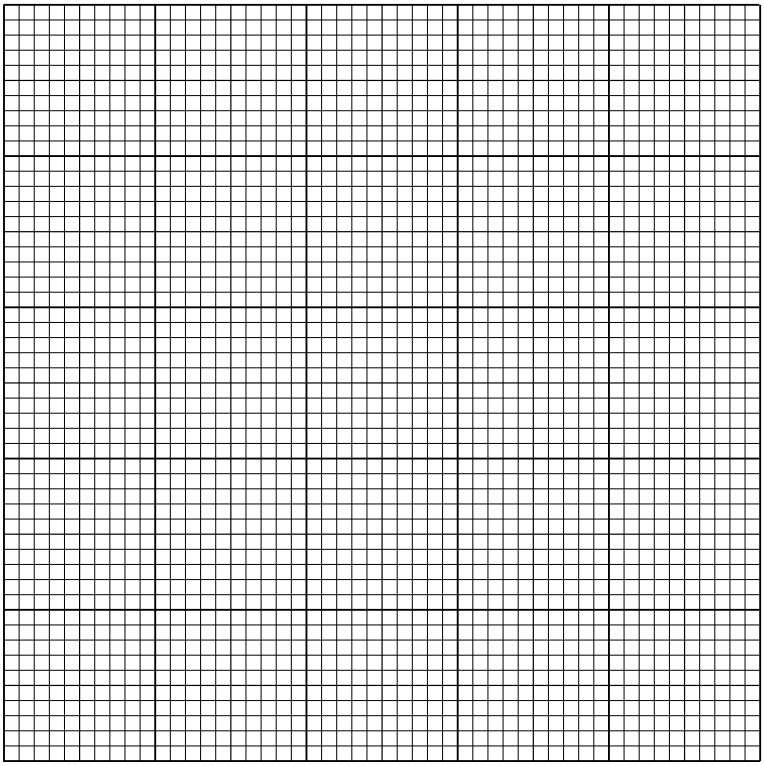
A student investigated the effect of changing the concentration of hydrogen peroxide solution on this hydrolysis.
For each concentration of hydrogen peroxide solution the time to collect 25 cm^3 of oxygen was recorded.

Table 1.1 shows the results of the student's investigation.

Table 1.1

percentage concentration of hydrogen peroxide	**time to collect 25 cm^3 of oxygen / s**
4	47
8	18
12	15
16	13
25	11

(b) (i) Plot a graph of the data shown in Table 1.1.



[4]

(ii) Explain the effect of changing the concentration of hydrogen peroxide.

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..... [3]

[Total: 22]

2 **K1** is a slide showing transverse sections through blood vessels.

Select one large artery and one large vein.

(a) **(i)** Draw a large plan diagram of two different types of blood vessel on slide **K1**.

Label the muscle layer in the artery.

[5]

Fig. 2.1 is a photomicrograph of a transverse section through lung tissue.

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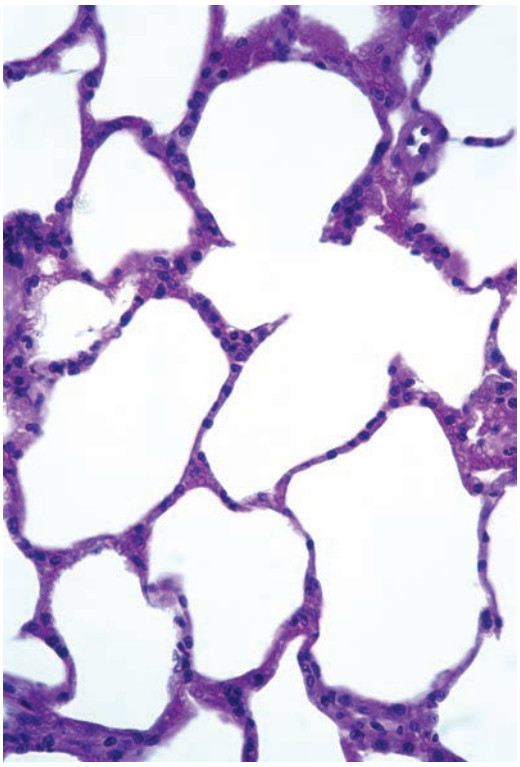


Fig. 2.1

(ii) Make a large drawing to show the walls of **two** whole alveoli that are touching each other.

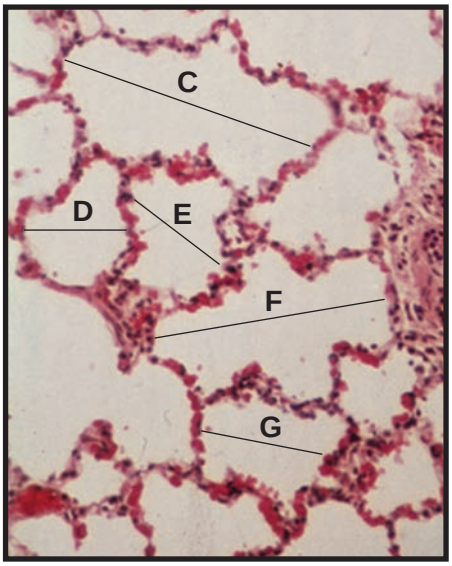
Label the gas exchange membrane.

[5]

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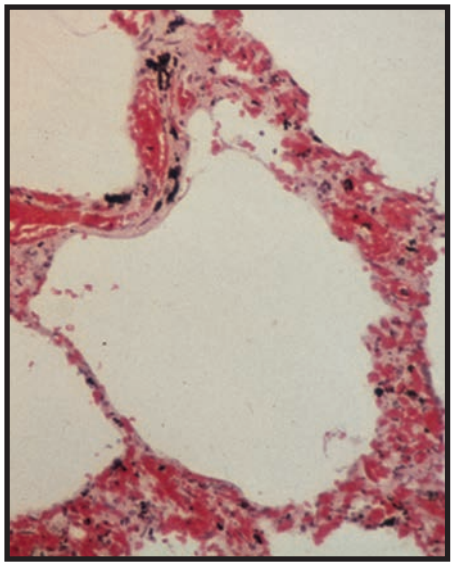
Fig. 2.2 is a photomicrograph of a transverse section through healthy lung tissue.

Fig. 2.3 is a photomicrograph of a transverse section through unhealthy lung tissue.



magnification × 95

Fig. 2.2



magnification × 95

Fig. 2.3

To find the mean diameter of an alveolus in the healthy lung, a student measured five alveoli, as shown by the lines **C**, **D**, **E**, **F** and **G** in Fig. 2.2.

(iii) Use the magnification to calculate the mean actual diameter, in μm, of an alveolus using the lines **C**, **D**, **E**, **F** and **G**.

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

..... μm [3]

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(iv) Prepare the space below so that it is suitable for you to show the observable differences between the specimens in Fig. 2.2 and Fig. 2.3.

Record your observations in the space you have prepared.

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[5]

[Total: 18]

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