Centre Number	Candidate Number	Name

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

BIOLOGY **9700/03**

Paper 3 Practical Test AS

May/June 2003

1 hour 15 minutes

Candidates answer on the Question Paper.
Additional Materials: As listed in Instructions to Supervisors.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.
You are advised to spend 45 minutes on Question 1 and 30 minutes on Question 2.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
1	
2	
Total	

This document consists of **6** printed pages, **1** blank page and a Report Form.

© CIE 2003
UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate
[Turn over

Question 1 [45 minutes]

Enzymes in respiring yeast convert glucose to carbon dioxide and water. You are required to investigate the effects of temperature on these enzymes by measuring the rate of carbon dioxide production.

You are provided with a suspension of yeast in water to which glucose has been added, labelled **S1**.

Prepare a water-bath by half-filling a 250 cm^3 beaker with water and maintain its temperature between 35 °C and 40 °C.

Label two boiling tubes **T1** and **T2** respectively.
Add 20 cm^3 of yeast suspension to a boiling tube **T1** and fit the bung and delivery tube provided.
Add 20 cm^3 of tap water to **T2** and fit the bung and delivery tube provided. Ensure that the bungs are of a sufficiently tight fit to make them airtight.
Place the boiling tubes in the water-bath with the delivery tubes in test-tubes of cold water, as shown in Fig. 1.1.

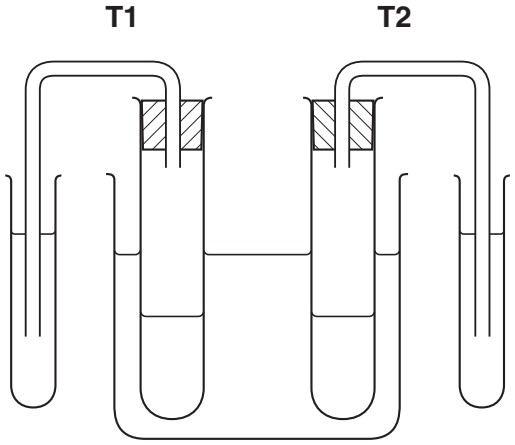


Fig. 1.1

You will soon notice bubbles of gas appearing from the ends of the delivery tubes.

Wait three minutes.

(a) (i) Count the number of bubbles produced by **T1** in 30 seconds. Enter your reading in Table 1.1. Wait 30 seconds and then count the bubbles produced by **T2** in the next 30 seconds. Repeat this procedure twice more. This will give you three readings for each boiling tube.

Table 1.1

	bubbles / 30 sec			
	35 °C – 40 °C		45 °C – 50 °C	
reading	**T1**	**T2**	**T1**	**T2**
1				
2				
3				
mean				

(ii) Increase the temperature of the water-bath to between 45 °C and 50 °C and repeat the experiment.

Enter your readings in Table 1.1.

(iii) Calculate the mean bubbling rates for all four sets of figures and enter your results in Table 1.1.

[4]

(b) Explain why you waited three minutes before counting the gas bubbles.

.....

.....

.....[2]

(c) With reference to your results, explain the effect of raising the temperature of **T1** to between 45 °C and 50 °C.

.....

.....

.....

.....

.....

.....[4]

(d) State the purpose of **T2** in your experiment and explain how it could be used to make your results more reliable.

.....

.....

.....

.....[2]

(e) Explain how you could improve the procedure even further to ensure that your results were even more reliable.

.....

.....

.....

.....[3]

[Total : 15]

Question 2 [30 minutes]

You are provided with a stained slide of a section through a mammalian lung, labelled **S2**.

Examine **S2** carefully using the low power on your microscope to find an area similar to that shown in Fig. 2.1.

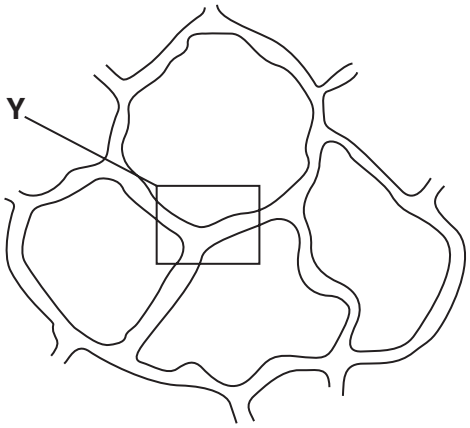


Fig 2.1

(a) Make a large, labelled, high-power drawing to show the arrangement and different types of cells present at the junction of three alveoli walls, as shown in the area labelled **Y** in Fig. 2.1.

[6]

(b) Use the eyepiece graticule provided to determine the ratio between the diameter of an alveolus and the thickness of its wall. Explain your procedure.

.....

.....

.....

.....

.....[4]

[Total : 10]

BLANK PAGE

REPORT FORM

The teacher responsible for this subject is asked to answer the following questions.

(a) Was the candidate physically handicapped in drawing or in using a microscope or is the candidate colourblind? If so, give brief details.

(b) Was the candidate handicapped by deficient material or apparatus? If so, give brief details.

(c) Was it necessary to make any substitutions for the materials sent from Cambridge? If so, give brief details of the circumstances.

(d) Any comments.

Signed .....

N.B. Information that applies to all candidates need be given on the first candidate's answer book only.