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.

#### 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<sup>3</sup> beaker with water and maintain its temperature between 35 °C and 40 °C.

Label two boiling tubes T1 and T2 respectively.

Add 20 cm<sup>3</sup> of yeast suspension to a boiling tube **T1** and fit the bung and delivery tube provided. Add 20 cm<sup>3</sup> 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.

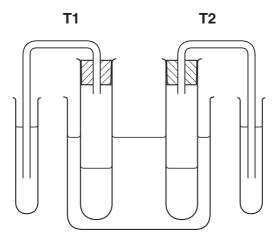


Fig. 1.1

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	s/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 mea	n bubbling r	ates for	all four	sets of	figures	and ent	er your	results i	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.
	[14]

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.

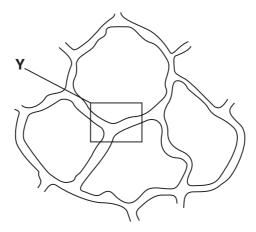


Fig 2.1

(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.

Use the eyepiece graticule provided to determine the ratio between the diameter of an alveolus and the thickness of its wall. Explain your procedure.	b)
[4]	
[Total : 10]	

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# **REPORT FORM**

The teacher responsible for this subject is asked to answer the following question	The	e teacher	responsible	for this sub	piect is asked	l to answer t	he following	auestions
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	,	<b>J</b> 1
(a)	Was the candidate physically handicapped in discandidate colourblind? If so, give brief details.	rawing or in using a microscope or is the
(b)	) Was the candidate handicapped by deficient mate	erial or apparatus? If so, give brief details.
(c)	e) Was it necessary to make any substitutions for the brief details of the circumstances.	e materials sent from Cambridge? If so, give
(d)	I) Any comments.	
	Signe	edb

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