Centre Number	Candidate Number	Name

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Level

BIOLOGY **9700/05**

Paper 5 Practical Test A2

May/June 2003

1 hour 30 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 30 minutes on each of the three questions.

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	
3	
TOTAL	

This document consists of **7** printed pages, and a Report Form.

BR (PW) S41675/2

University of Cambridge
Local Examinations Syndicate

[Turn over

Question 1 [30 minutes]

You are required to compare the amount of urea in three different samples of artificial body fluid. The three artificial body fluids are plasma from the renal artery, plasma from the renal vein and urine. They are in test-tubes labelled **F1**, **F2** and **F3** but not necessarily in that order.

Urease is an enzyme that breaks down urea to produce ammonia.
You are also provided with a solution of urease, labelled **F4**.

Ammonia turns red litmus paper blue.

Use the syringe provided to add 5 cm^3 of urease to each test-tube.

Moisten three pieces of litmus paper with water and place a piece of litmus paper in each test-tube, such that it is trapped by the bung, as shown in **Fig 1.1**.

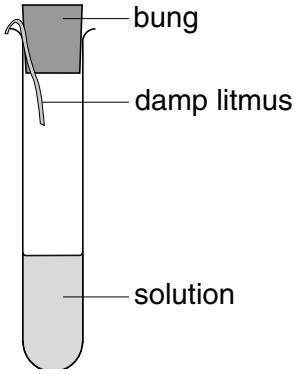

Fig. 1.1

Start timing and record how long it takes for the litmus paper to begin to change colour.
If a colour change has not occurred within 20 minutes, record the time as infinity (∞).

(a) (i) Record your results in Table 1.1.

Table 1.1

test-tube	time taken to begin to change colour / min
F1	
F2	
F3	

[2]

(ii) State what colour the litmus paper turned in **F2**.

.....[1]

(iii) For each solution, **F1**, **F2** and **F3**, suggest which is urine, which is renal artery plasma and which is renal vein plasma.

Explain your answer.

F1 .....

.....

F2 .....

.....

F3 .....

.....[5]

(b) Suggest how the experiment could be modified to improve the accuracy of your results.

.....

.....

.....[2]

[Total: 10]

Question 2 [30 minutes]

You are provided with a stained, transverse section of a mammalian trachea, labelled **S3**.

Examine slide **S3** with your microscope, using low power.
Fig. 1.2 shows a plan diagram of the tissues that you should expect to see.

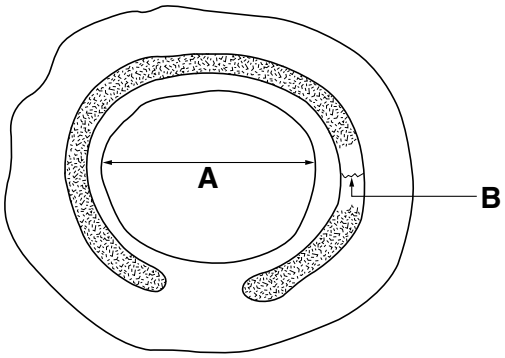

Fig. 1.2

Locate the lumen of the trachea, **A** and the cartilage, **B**.

(a) Make a labelled high-power drawing of **two** of the cells that line the lumen.

[4]

(b) Make a labelled high-power drawing of **two** cartilage cells.

[4]

(c) State **two** visible differences between the cells that line the lumen and the cells from the cartilage.

.....

.....

.....

.....[2]

[Total: 10]

[Turn over

Question 3 [30 minutes]

An experiment was carried out to investigate the effect of wind speed on the rate of transpiration of a leafy shoot. The apparatus used is shown in Fig. 3.1.

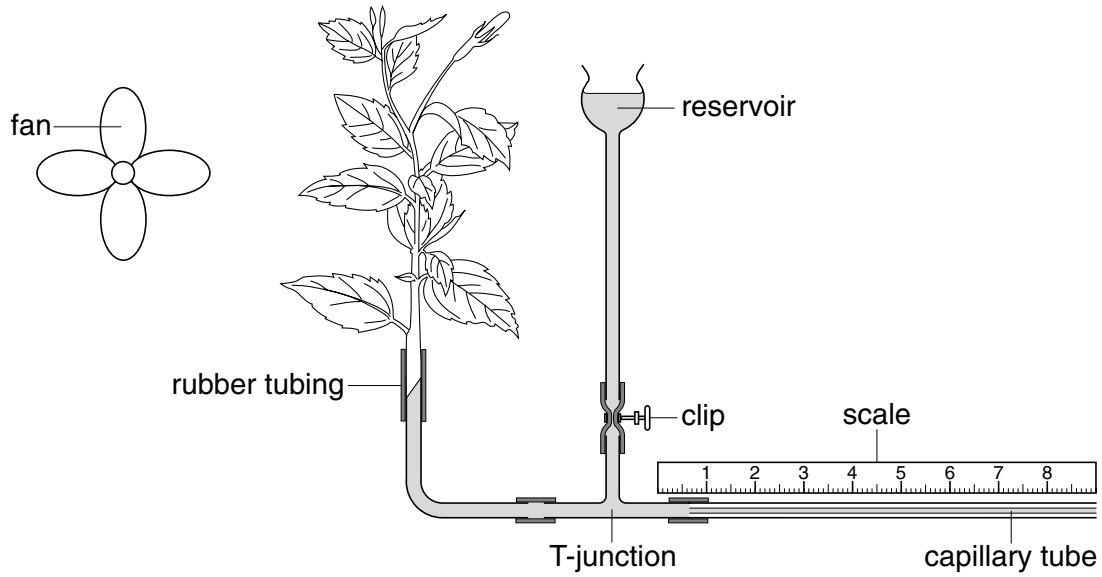

Fig. 3.1

(a) Explain how you would set up the apparatus before starting the experiment.

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.....

.....

.....

.....[3]

(b) Explain what factors, other than wind speed, would need to be controlled in order to obtain reliable results.

.....

.....[2]

(c) Explain how you would carry out the experiment and what measurements you would take.

.....

.....

.....

.....[3]

(d) Explain how you could calculate the volume of water being absorbed by the plant.

.....

.....

.....[2]

[Total:10]

[Turn over

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, or recommended in the confidential instructions? 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