Centre Number	Candidate Number	Name

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

BIOLOGY **9700/03**

Paper 3 Practical Test AS

May/June 2005

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 **both** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.
You are advised to spend 40 minutes on Question 1 and 35 minutes on Question 2.

For Examiner's Use	
1	
2	
Total	

This document consists of **7** printed pages and **1** blank page.

© UCLES 2005

1 You are required to investigate the effect of a bacterial digestive enzyme on protein.

You are provided with **one test-tube** containing a solution labelled **S1** and **three test-tubes** containing a solution labelled **S2**. Both solutions, **S1 and S2**, contain the bacterial enzyme at pH7, but solution **S1** has been boiled.

You are also provided with four lengths of glass capillary tubing that contain solidified egg white. Egg white contains the protein albumin.

Place one length of capillary tubing into each test-tube as shown in Fig. 1.1. Avoid getting any solution on your skin.

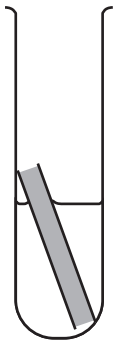


Fig. 1.1

Place the test-tube labelled **S1** into a water bath at approximately 35 °C.

Place one of the test-tubes labelled **S2** into a water bath at approximately 45 °C.

Place two of the test-tubes labelled **S2** into a water bath at approximately 35 °C.

To **one** of the 35 °C test-tubes labelled **S2** add dilute acid drop by drop until it has a pH of less than 3. Count the drops. Use universal indicator paper to check the pH. Label this test-tube **pH3**.

Add the **same number of drops** of distilled water to each of the other three test-tubes.

(a) (i) Explain why is was necessary to add the same number of drops of distilled water to the other three test-tubes.

.....

.....[1]

Leave the solutions for at least thirty minutes.

While you are waiting, you may start question 1 (b).

© UCLES 2005

(ii) Gently shake each test-tube. Carefully examine the capillary tubes, still within the test-tubes, in front of the dark coloured card. Draw what you see in the boxes below.

capillary tube in **S1** at 35 °C at pH7	capillary tube in **S2** at 35 °C at pH7
capillary tube in **S2** at 45 °C at pH7	capillary tube in **S2** at 35 °C at <pH3

[2]

(iii) Give a detailed explanation of your results.

.....

.....

.....

.....

.....

.....[3]

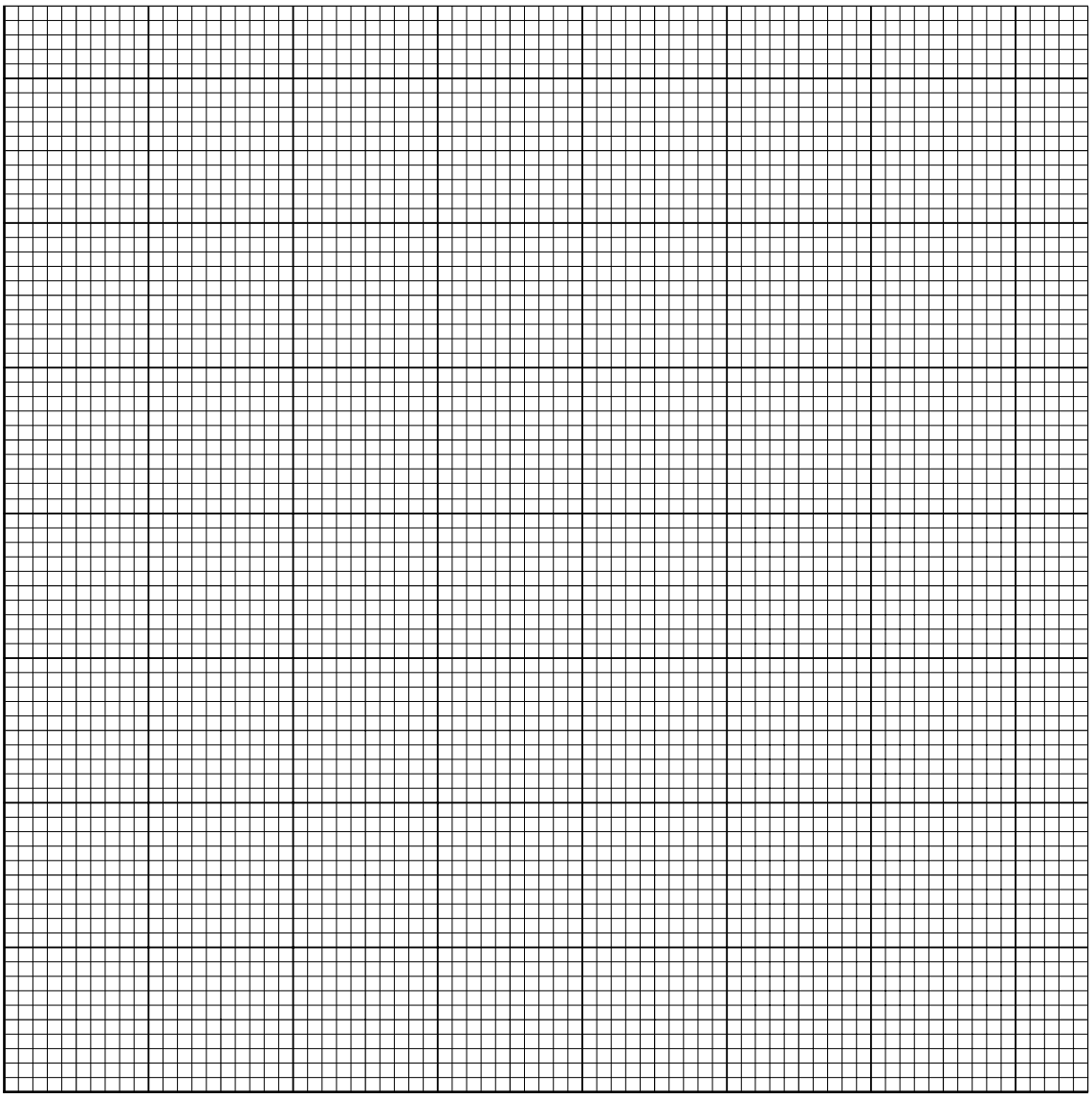
© UCLES 2005

(b) A student carried out a similar experiment for a longer period of time, using a range of buffer solutions. The results are shown in Table 1.1.

Table 1.1

pH	length of egg white remaining / mm	length of clear tube / mm
6	20	10
7	17	13
8	15	15
9	23	7
10	26	4
11	28	2

(i) Plot a graph of the pH against **one** of the other variables on the grid below.



[3]

© UCLES 2005

(ii) Explain why the rate of reaction changes with pH.

.....

.....

.....

.....[3]

(c) Explain how the experiment could be modified to determine the effect of enzyme concentration on the rate of the reaction.

.....

.....

.....

.....

.....[3]

[Total : 15]

© UCLES 2005

2 **K1** is a stained transverse section through part of a dicotyledonous plant.
Examine the specimen using the low-power of your microscope.

(a) **(i)** Draw a large, labelled, **plan** diagram to show the distribution of tissues.

[5]

(ii) State from which part of the plant the section was taken.
Explain your answer.

.....

.....

.....[2]

© UCLES 2005

(iii) Make a high-power drawing to show a group of **four** cells from the region nearest the centre of the specimen.
Labels are not required.

[3]

[Total : 10]

[Paper total : 25]

© UCLES 2005

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.