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

October/November 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 on all work you hand in.
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.
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.
You are advised to spend 45 minutes on Question 1 and 30 minutes on Question 2.

For Examiner's Use	
1	
2	
Total	

This document consists of **8** printed pages and **4** blank pages.

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1 Starch is a storage product found in many plant cells.

It contains a carbohydrate called amylose that stains blue / black in the presence of iodine in potassium iodide solution.

You are provided with three solutions of the enzyme amylase, of different concentrations, labelled **A1**, **A2** and **A3**. Do not assume that they are in the correct order of concentration.

You are also provided with a suspension of starch.

You are required to investigate the effect of the three enzyme concentrations on the starch suspension.

Place three rows of five separate drops of iodine solution onto a **dry** tile.

Label the rows **A1**, **A2** and **A3**, as shown in Fig. 1.1.

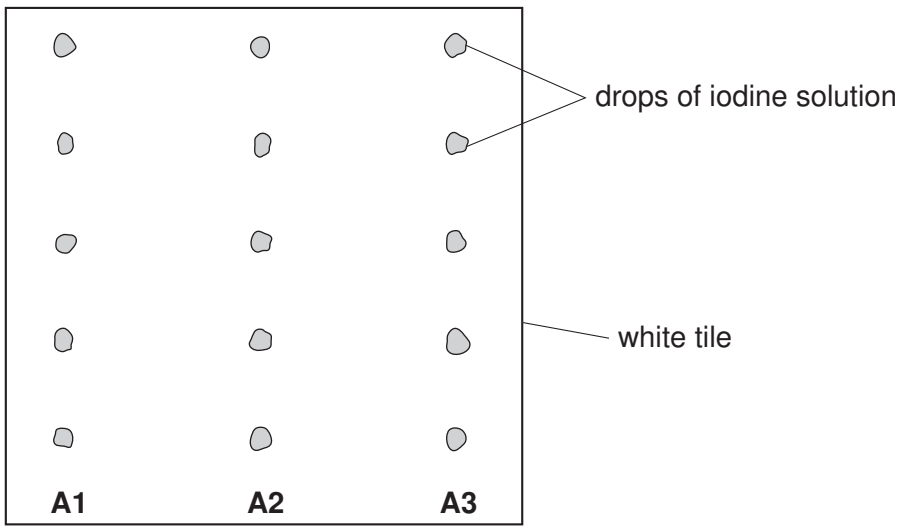


Fig. 1.1

(a) **(i)** Use the prepared tile to investigate the effect of enzyme concentration on the starch suspension.

Take no more than ten minutes to complete your investigation.

Record your observations in Table 1.1.

Table 1.1

amylase concentration	observations
A1	
A2	
A3	

[2]

(ii) Explain your procedure.

.....

.....

.....

.....

..... [3]

(b) A student carried out a similar experiment and obtained the results shown in Table 1.2.

Table 1.2

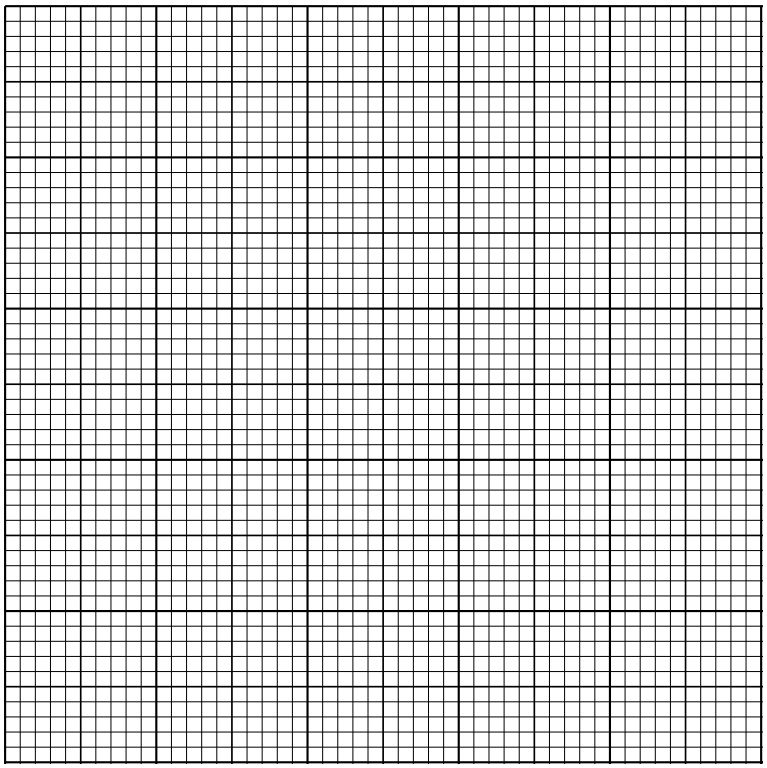
amylase concentration / %	time taken for complete hydrolysis / min	rate of reaction / min^{-1}
0.5	10	0.1
1.0	8	0.125
1.5	5	0.2
2.0	2	

Rate can be calculated by using the formula;

$$\text{rate} = \frac{1}{\text{time/min}}$$

(i) Complete the table to show the rate for 2.0% amylase concentration. [1]

(ii) Use the data in Table 1.2 to plot a graph of amylase concentration against **one** of the other variables, on the grid below.



[4]

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(iii) Explain these results.

.....

.....

..... [2]

(c) Explain how the experiment could be modified to investigate the effect of temperature on the rate of reaction.

.....

.....

.....

.....

.....

..... [3]

[Total: 15]

2 **S1** is a slide of mammalian liver.

(a) **(i)** Make a high-power drawing to show a group of **four** cells.

Labels are **not** required.

[4]

(ii) The mean width of a liver cell is 30 μm

Use the eyepiece graticule to determine the mean width of a nucleus.

Show your working.

mean width of nucleus ..... μm [3]

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QUESTION 2 CONTINUES ON PAGE 8

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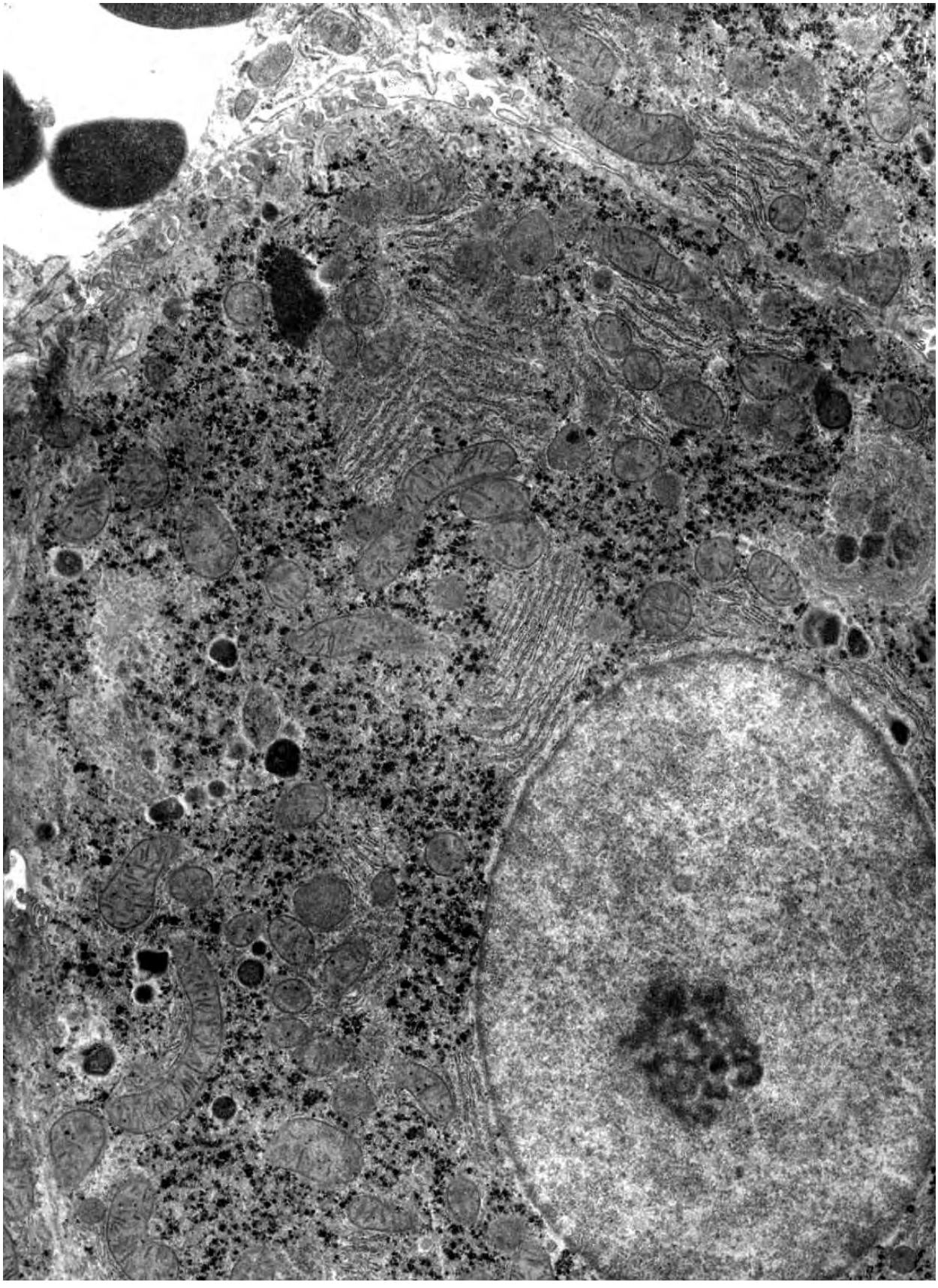
(b) Fig. 2.1 is a electronmicrograph of a liver cell.



×10000

Fig. 2.1

For Examiner's Use

(i) Name **four** visible structures on the electronmicrograph that cannot be seen on the microscope slide.

1. .....

2. .....

3. .....

4. ..... [2]

(ii) Explain why these structures are visible on the electronmicrograph but not on the microscope slide.

.....

..... [1]

[Total: 10]

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Copyright Acknowledgements:

Fig. 2.1 Taken from http//web.mit.edu/7.19/www/lecture8/JPEGS/Lec8a/P814liver_ep.jpg © Massachusetts Institute of Technology

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