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Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Level

BIOLOGY **9700/05**

Paper 5 Practical Test A2

October/November 2004

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 60 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 **7** printed pages and **1** blank page.

(NH) S67012/2
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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. Iodine is also a powerful enzyme inhibitor.

You are provided with a solution of the enzyme amylase, labelled **A**. The enzyme amylase hydrolyses starch.

You are also provided with a suspension of starch, labelled **S**.

You are required to plan, devise and carry out a method to investigate the effect of the enzyme solution on the suspension of starch. In order to ensure that your results are reliable, you will need to consider:

- the identification of a consistent end point.
- a calculation of a mean time taken for complete hydrolysis.
- the volume of solutions **A** and **S** which you have available.

(a) (i) Describe how you carried out your investigation.

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.....[7]

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(ii) Record your observations by making and completing a table in the space below.

[4]

(b) A student carried out a similar investigation and obtained the following data.

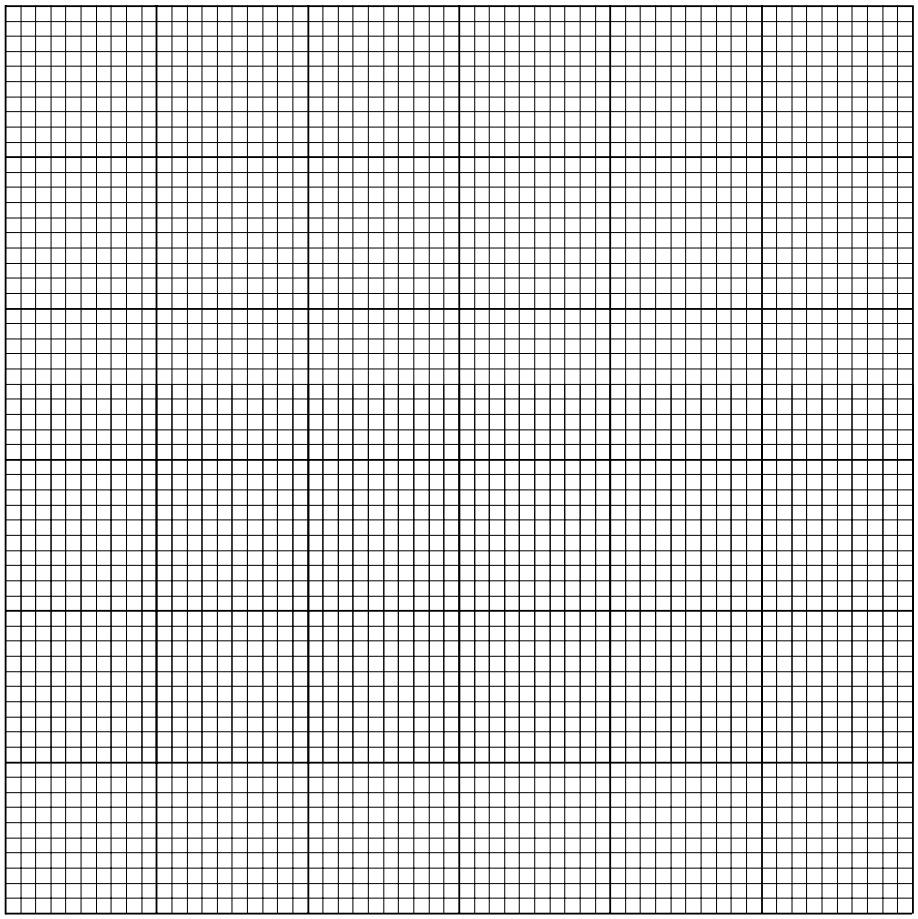
(i) Calculate the rate of reaction for an amylase concentration of four arbitrary units and complete the table.

amylase concentration / arbitrary units	mean time taken for complete hydrolysis / min	rate of reaction / min^{-1}
1	5.02	0.20
2	2.45	0.41
3	1.69	0.59
4	1.24	
5	0.98	1.02

[1]

rate = 1/t t = time in minutes

(ii) Plot the results from the table on the grid to show rate of reaction against amylase concentration.



[3]

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(iii) Explain these results as fully as possible.

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.....[3]

(c) The data that you have been given were obtained in a laboratory with a variable air temperature of about 20 °C. Suggest how the laboratory procedure could have been improved.

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.....[2]

[Total: 20]

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[Turn over

2 **K1** is a stained, transverse section through the pancreas of a small mammal.

(a) Examine **K1** using both low-power and high-power objectives of your microscope. Move the slide around so that you see the different structures present.
The organ consists of tissue, within which are scattered large numbers of islets of Langerhans.

(i) State three visible features of **K1** that allow you to distinguish islets from the surrounding tissue.

1. .....

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2. .....

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3. .....

.....[3]

(ii) State any differences in structure between different islets that you have observed.

.....[1]

(iii) Suggest **two** explanations for any differences that you state in **(a) (ii)**.

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.....[2]

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(b) Look at a range of islets and choose **one** that shows a number of adjacent cells clearly. Draw a large, labelled high-power drawing of five cells from that islet.

[4]

[Total: 10]

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