



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

CANDIDATE  
 NAME

CENTRE  
 NUMBER

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**BIOLOGY**

**9700/32**

Paper 3 Practical Test AS

**October/November 2007**

**2 hours**

Candidates answer on the Question Paper.

Additional Materials: As listed in the confidential instructions

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
 Write in dark blue or black pen in the spaces provided on the Question Paper.  
 You may use a pencil for any diagrams, graphs or rough working.  
 Do not use staples, paper clips, highlighters, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

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 an hour on each question.

At the end of the examination, fasten all your work securely together.

| For Examiner's Use |  |
|--------------------|--|
| 1                  |  |
| 2                  |  |
| <b>Total</b>       |  |

This document consists of **9** printed pages and **3** blank pages.



You are reminded that you have only one hour for each question in the practical examination.

You should read carefully through the whole of each question and then plan your use of the time to make sure that you finish all of the work that you would like to do.

1 You are provided with four strips of potato, labelled **P**, and a solution, labelled **S**. You are also provided with the following materials.

- Benedict’s solution
- distilled water

(a) Use the Benedict’s solution to identify the nature of the unknown solution **S**.

Cut **one** of the potato strips into several pieces. Repeat the test on the pieces of the potato strip.

Describe the tests performed and their meaning.

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.....[2]

(b) You are now going to investigate the effect of solution **S** on potato strips **P**. Carefully follow the instructions below. Take care to organise your equipment so that your results are recorded correctly.

You should present and record your observations and data in the space provided. You will need to:

- read through the instructions carefully,
- make some decisions,
- prepare the space on page 3 so that it is ready for you to record the readings.
- Place 20cm<sup>3</sup> of solution **S** in a Petri dish.
- Place 10cm<sup>3</sup> of solution **S** and 10cm<sup>3</sup> of distilled water in a second Petri dish.
- Place 20cm<sup>3</sup> of distilled water in a third Petri dish.
- Using a scalpel or sharp knife, carefully trim as accurately as possible, each potato strip to a length of 50 mm.
- Place one potato strip into each of the three Petri dishes.
- Tilt the Petri dish as shown in Fig. 1.1 so that the strips are covered by the solution.



Fig. 1.1

- Leave for at least 30 minutes.

While you are waiting you should move on to Questions 1(d) to (f).

- After 30 minutes, remove the strips from the Petri dishes and blot them carefully with a paper towel. Accurately measure their lengths and record any observations of differences between them.
- (i) Record the data and observations in the space below.

[4]

- (ii) Estimate the uncertainty in the measurement of the actual length of the potato strip that has been in water.

actual size measured .....

uncertainty = .....[1]

- (iii) Suggest how an error in measuring the lengths could occur.

.....  
 .....  
 .....[1]

- (c) Temperature is a variable that was not controlled in this experiment.

- (i) Suggest how temperature could be controlled.

.....  
 .....[1]

- (ii) Identify two **other** significant sources of error in this experiment other than temperature.

1. ....  
 .....  
 2. ....  
 .....[2]

- (d) In a similar investigation involving a range of sucrose concentrations, the results in Table 1.1 were obtained.

**Table 1.1**

| sucrose solution concentration / mol dm <sup>-3</sup> | percentage change in length of strips |
|---|---------------------------------------|
| 0.00 water  | +5.0                                  |
| 0.2   | +2.5                                  |
| 0.4   | -1.0                                  |
| 0.6   | -1.5                                  |
| 0.8   | -6.3                                  |
| 1.0   |                                       |

- (i) At 1.0 mol dm<sup>-3</sup> sucrose concentration, the mean length of strips before the experiment was 80.0 mm and after the experiment was 73.0 mm.

Calculate the missing value for the percentage change in length of the strips and complete Table 1.1.

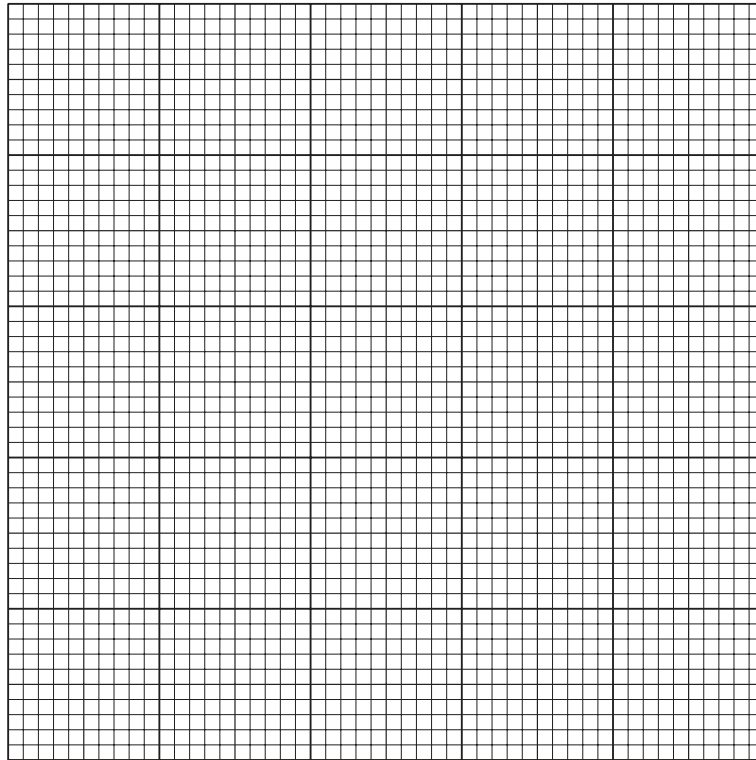
You may use the space below to show your working.

[1]

- (ii) When the student first performed this experiment the percentage change in length in a 0.8 mol dm<sup>-3</sup> solution was +3%. Suggest what the student did when this result was obtained and explain why.

.....  
 .....  
 ..... [1]

(iii) Plot a graph of the percentage change in length of the strips against the concentration of the sucrose solution using the student's results.



[3]

(e) The concentration of sucrose solution that would give no change in length was not found very precisely in the experiment. Suggest how it could be improved to give this more precisely.

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..... [3]

- (f) The student's hypothesis was
- the more concentrated the solution, the smaller the potato strips became.
- Draw an appropriate conclusion to the student's experiment.  
You should include in your conclusion whether the experimental data support the hypothesis and produce a revised or new conclusion if necessary.

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.....[3]

- (g) Other than temperature, suggest how the student could improve the experiment to reduce errors.

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.....[3]

[Total: 25]

2 You are provided with slide **K1**.

(a) (i) Draw a low-power plan diagram of the specimen on slide **K1**.

[2]

(ii) Use a ruler to measure the actual size of the specimen on slide **K1** and the size of your drawing across the same point.  
Draw a line on your drawing to show where you made your measurement.  
Calculate the magnification of your drawing.  
Show your working.

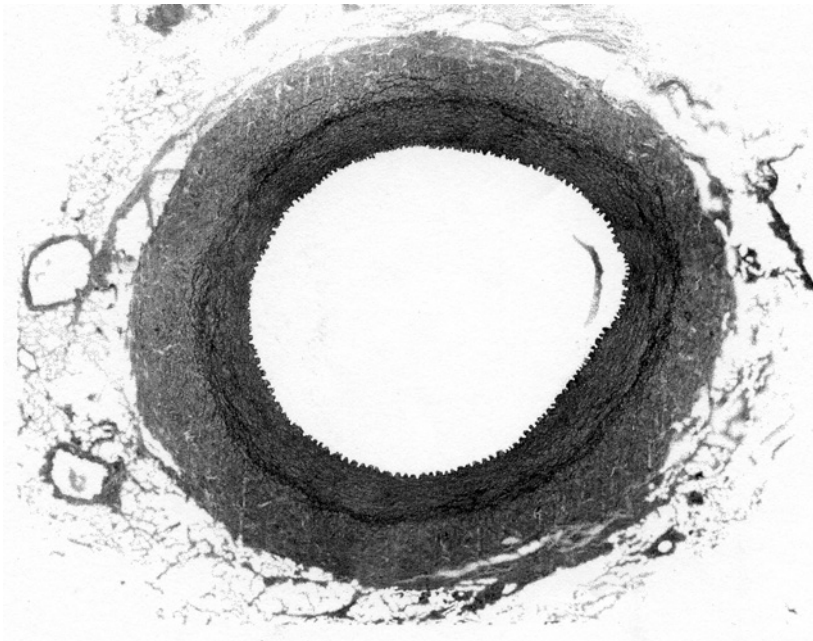
magnification .....[2]

- (b) The cartilage tissue on slide **K1** has been stained purple.
- (i) In the space below, make a high-power, labelled drawing of two adjacent cells in this tissue.

[6]



**Fig. 2.1** is a photomicrograph of a transverse section of an aorta.



**Fig. 2.1**

- (ii) Prepare the space below so that it is suitable for you to compare and contrast specimen **K1** with **Fig. 2.1** and then record your observations.

[4]

- (iii) Both the specimens, **K1** and **Fig. 2.1**, are involved in the movement of materials. State one observation that relates to this function.

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.....[1]

[Total: 15]





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