

Candidate Name \_\_\_\_\_

Centre Number

Candidate

Number

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**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**General Certificate of Education Advanced Subsidiary Level**  
**and Advanced Level**

**BIOLOGY**

PAPER 3 Practical Test AS

**9700/3**

**MAY/JUNE SESSION 2002**

1 hour 15 minutes

Candidates answer on the question paper.

Additional materials:

As listed in Instructions to Supervisors

**TIME** 1 hour 15 minutes

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

**INFORMATION FOR CANDIDATES**

The intended 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 question paper consists of 5 printed pages, 2 blank pages and a Report Form.**



**Question 1** [45 minutes]

You are provided with five different concentrations of sucrose solution in Petri dishes, labelled **W1**, **W2**, **W3**, **W4** and **W5**.

The concentration of the sucrose solution does **not** correspond to the order of the labelling.

You are also provided with ten potato strips, labelled **W6**.

Using a scalpel or a sharp knife, carefully trim each strip to a length of 50 mm. It is very important that you perform this task as accurately as possible.

Place two strips of potato into each Petri dish and **leave for at least twenty minutes**.

While you are waiting, you should start Question 2.

After twenty minutes, remove the strips from each Petri dish, blot carefully with a paper towel and accurately re-measure their lengths.

- (a) (i) Record the lengths of the strips in Table 1.1 and calculate the mean strip length and mean change in strip length, for each solution.

**Table 1.1**

	<b>W1</b>	<b>W2</b>	<b>W3</b>	<b>W4</b>	<b>W5</b>
<b>length of strip 1</b>					
<b>length of strip 2</b>					
<b>mean length</b>					
<b>mean change in length</b>					

[4]

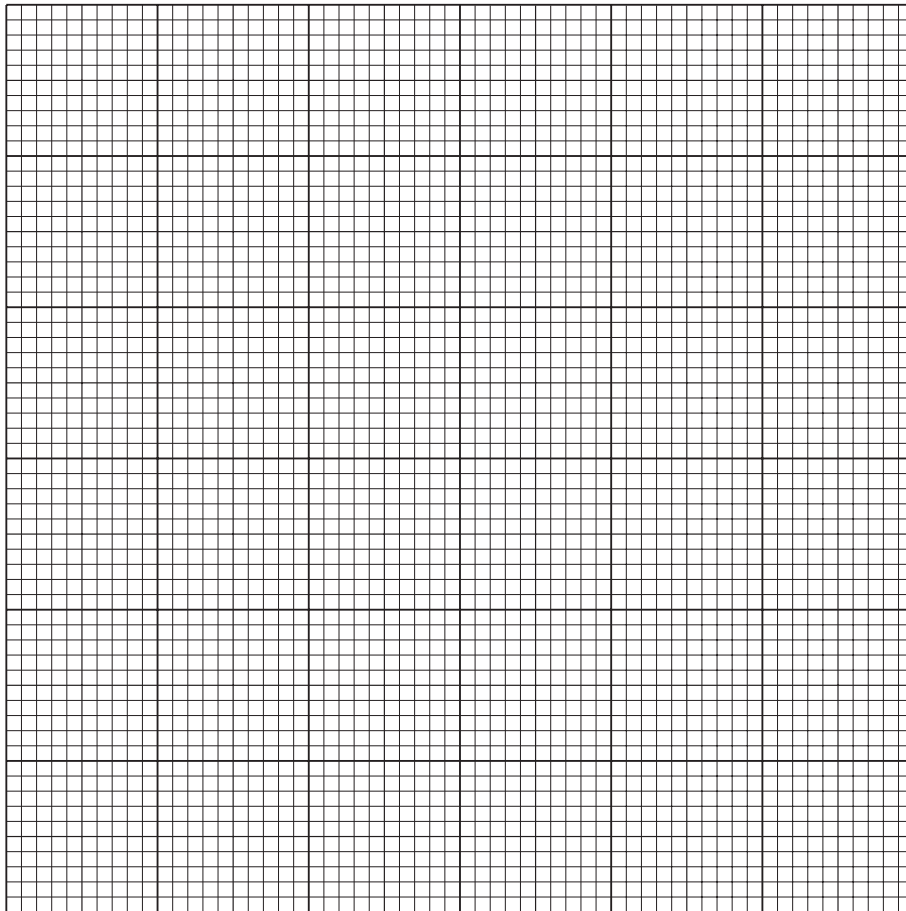
- (ii) The concentration of each solution is given in Table 1.2. From your results, decide which labelled solution corresponds to the concentration indicated and enter **W1**, **W2**, **W3**, **W4** and **W5** in the table.

**Table 1.2**

<b>solution concentration mol/dm<sup>3</sup></b>	<b>1.0</b>	<b>0.8</b>	<b>0.6</b>	<b>0.4</b>	<b>0.2</b>
<b>solution name</b>					

[3]

- (iii) On the grid, plot a graph of the mean change in length against the molar concentration.



[3]

- (iv) Use the graph to determine the molar concentration that is equal to the solute potential of the potato cell sap.

.....[1]

- (v) State what is happening to the osmotic movement of water, through the cell membrane, at this concentration.

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

(b) Suggest three ways in which you could improve this experiment to make your results more reliable.

1. ....

.....

2. ....

.....

3. ....

.....[3]

[Total : 15]

**Question 2** [30 minutes]

**K7** is a stained, transverse section of an aorta.  
Examine **K7**, using a hand lens and a microscope.

(a) Make a large, labelled, accurate plan drawing of **K7**.

[4]

(b) State the magnification of your drawing and your method of calculating it.

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

(c) Explain the significance of the thickness of the wall and the appearance of the inner lining of the aorta.

*wall* .....  
.....  
.....

*inner lining* .....  
.....  
.....[4]

[Total : 10]

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**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? 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.*