

Centre Number	Candidate Number	Name
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**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
General Certificate of Ordinary Level

**BIOLOGY**

**5090/06**

Paper 6 Alternative to Practical

May/June 2004

**1 hour**

Candidates answer on the Question Paper.  
No Additional Materials are required.

**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** the questions.  
The number of marks is given in brackets [ ] at the end of each question or part question.

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.

<b>For Examiner's Use</b>	
<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>Total</b>	

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



- 1 Fig. 1.1 shows an apparatus used to investigate the uptake of water by a cut stem of a fresh green plant.

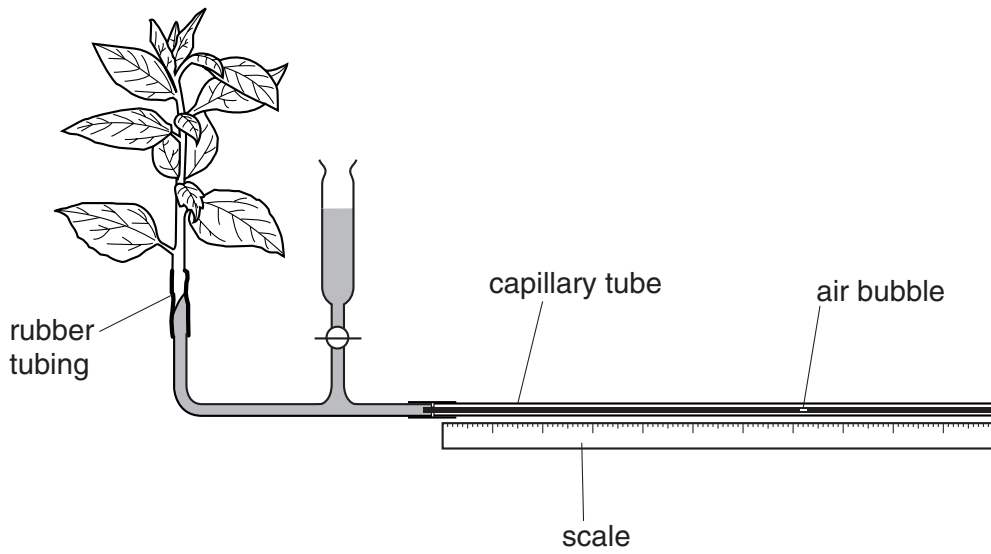


Fig. 1.1

- (a) (i) Draw an arrow on Fig. 1.1 to show the direction in which the air bubble moves when the plant takes up water. [1]
- (ii) The water enters the cut stem of the plant. Describe the path taken by the water from the point at which it enters the cut stem to the atmosphere around the shoot.

.....

.....

.....

.....

..... [3]

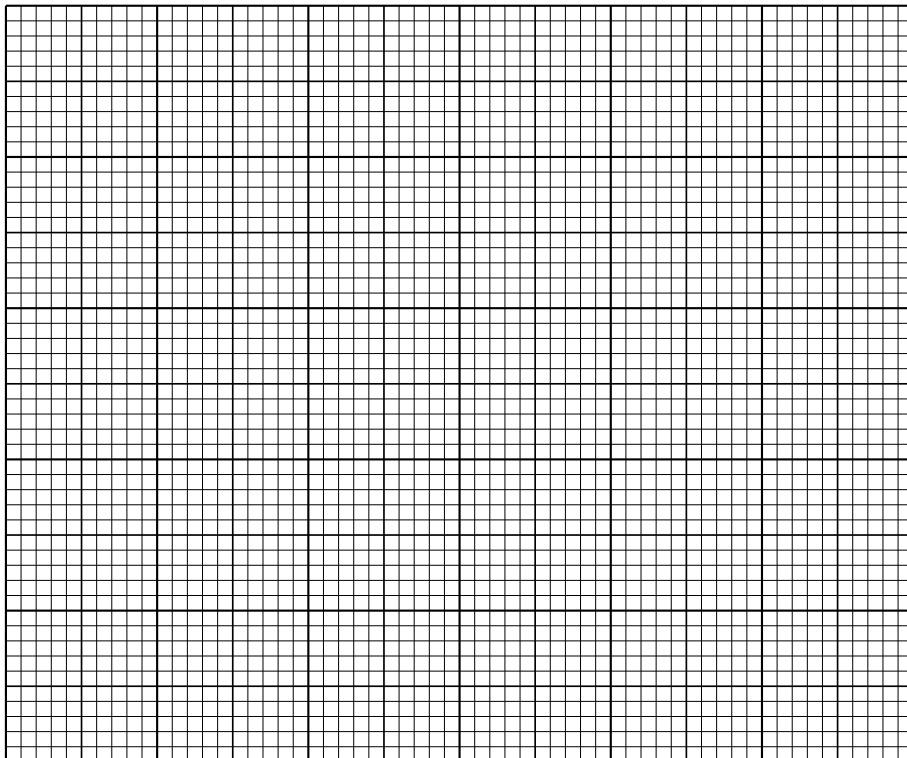
- (b) (i) A student carried out an investigation using the apparatus shown in Fig. 1.1, of water uptake by the cut stem.

The data collected is shown in Table 1.1.

**Table 1.1**

time of day	distance moved by bubble / mm per min
06.00	1
08.00	3
10.00	8
12.00 mid-day	16
14.00	14
15.00	11
18.00	2

Construct a line graph of the data on the grid below.



[5]

(ii) Describe the pattern of water uptake between 0600 and 1800 hours.

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

(iii) Suggest two external factors that might have changed to cause this pattern of water uptake.

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

(c) Suggest how the apparatus could be used to determine the effect of wind speed on water uptake.

.....  
.....  
.....  
.....  
..... [3]

[Total: 15]

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- 2 Fig. 2.1 is a photomicrograph of a section across an artery and a vein.

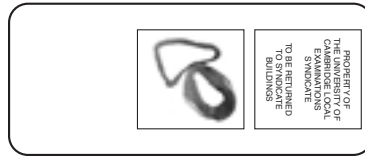


**Fig. 2.1**

- (a) (i) Make a large, labelled drawing of the artery and the vein as shown in Fig. 2.1.

[5]

(ii) Fig. 2.2 shows an image of the actual slide from which the photograph in Fig. 2.1 was taken.



**Fig. 2.2**

Calculate the magnification of your drawing.

*width of actual specimen* .....

*width of your drawing in (a)(i)* .....

*Show your working.*

*magnification* ..... [3]

(iii) Complete Table 2.1 to describe three differences that you can see between the artery and the vein.

**Table 2.1**

artery	vein
1. .... .....	..... .....
2. .... .....	..... .....
3. .... .....	..... .....

[6]

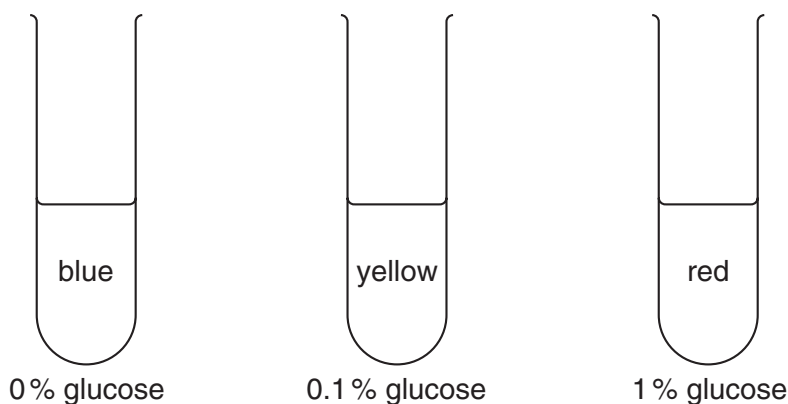
[Total: 14]



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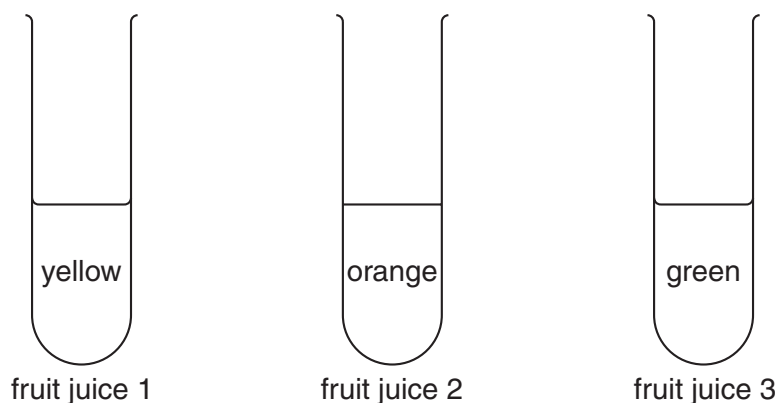
- 3 (a) A student carried out an investigation to find the colour change obtained when three different concentrations of glucose solution were tested for reducing sugar.

Fig. 3.1 shows the results.



**Fig. 3.1**

A second student carried out the same test on three different, colourless, fruit juices. Fig. 3.2 shows the results obtained by the second student.



**Fig. 3.2**

- (i) Estimate the concentrations of reducing sugar in each of the fruit juices tested.

*Fruit juice 1*.....

*Fruit juice 2*.....

*Fruit juice 3*..... [3]

- (ii) Suggest how you could make an accurate measurement of the concentration of reducing sugar in fruit juices.

.....

.....

..... [2]

**(iii)** The fruit juice with the highest concentration of reducing sugar was drunk by a diabetic. Describe how you would test a sample of urine from the diabetic for reducing sugar.

.....  
.....  
.....  
.....  
.....  
..... [3]

**(iv)** Describe and explain the result that you would expect from your experiment if the diabetic had recently been given an injection of insulin.

.....  
.....  
.....  
..... [3]

[Total: 11]

[Paper Total: 40]

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Figure 1.1 © D. Mackean.

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