

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

**BIOLOGY**

**5090/06**

Paper 6 Alternative to Practical

May/June 2003

**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** 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.

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

1 Fig. 1.1 shows a section through a flower.

(a) (i) Label the diagram on the answer lines provided.

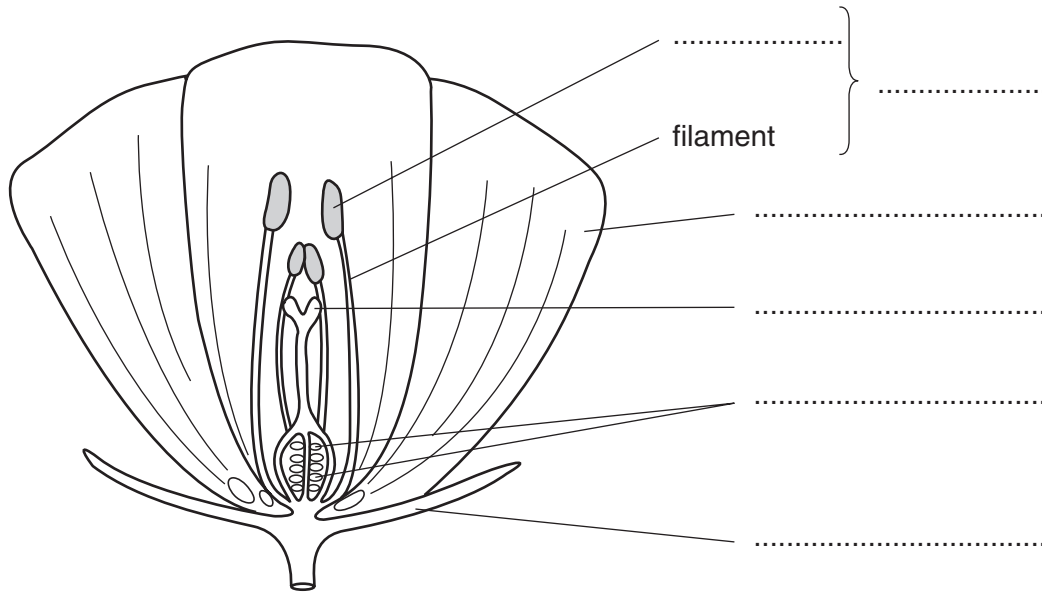


Fig. 1.1

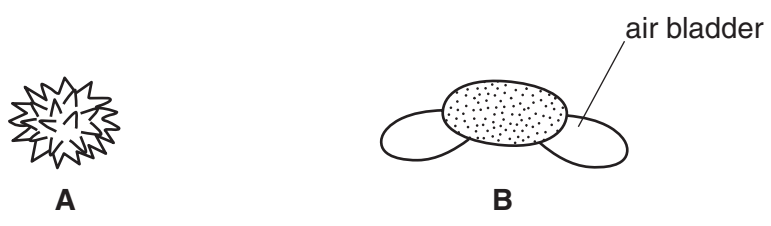
[6]

(ii) Describe, giving practical details, how you would prepare a slide of pollen grains and examine them using a microscope.

.....  
.....  
.....  
.....  
.....

[4]

(b) Fig. 1.2 shows pollen grains, **A** and **B**, taken from two different plant species.



(not drawn to scale)

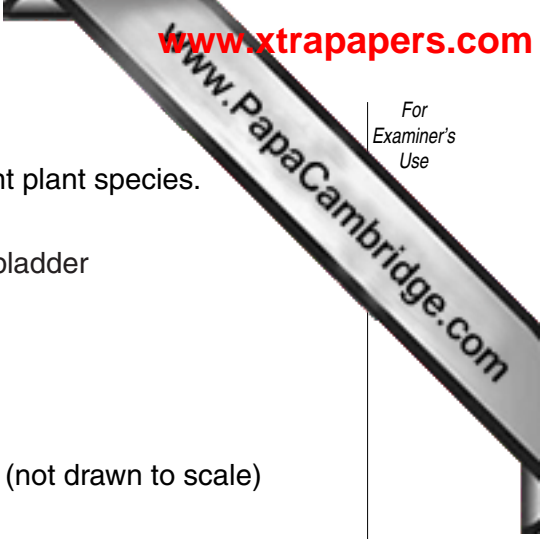
**Fig. 1.2**

Describe the appearance of the pollen grains, **A** and **B**, and relate the structure of each pollen grain, **A** and **B**, to its possible methods of dispersal.

**A** .....

**B** ..... [2]

[Total : 12]



- 2 Fig. 2.1 shows two test-tubes, **A** and **B**, both containing water. Each test-tube also contains a length of partially permeable Visking tubing that has been sealed at both ends. The Visking tube in **A** contains a suspension of starch. The Visking tube in **B** contains a suspension of starch and saliva.

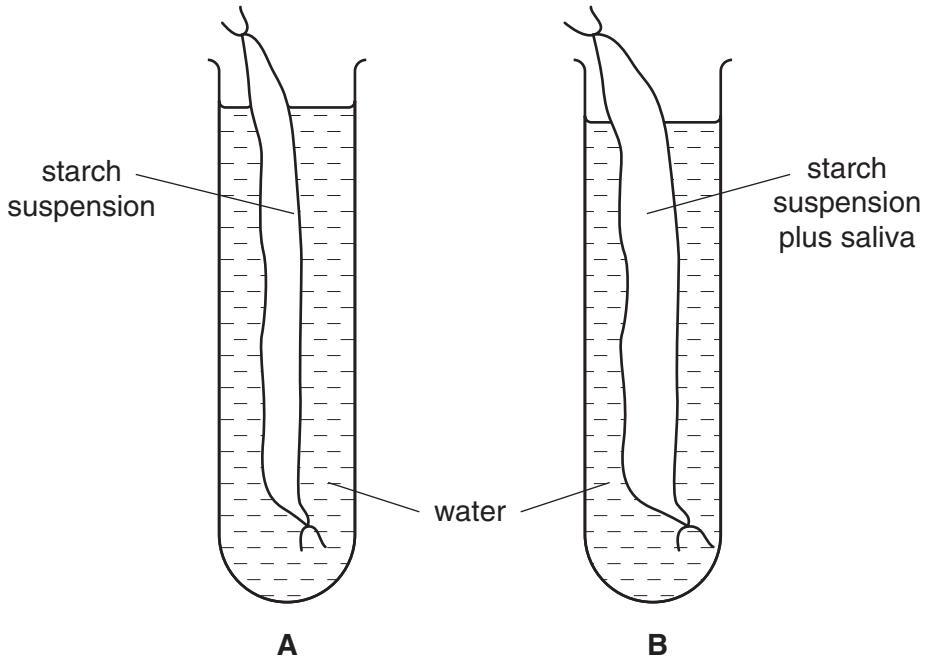


Fig. 2.1

The apparatus was left for twenty-four hours. After that time, samples of water from each test-tube and samples of solution from each Visking tube were tested for starch and reducing sugar.

- (a) Describe, giving practical details, how you would carry out a test for starch and a test for reducing sugar. State the positive result for each test.

*starch test* .....

*positive result* .....[1]

*reducing sugar test* .....

.....

.....

*positive result* .....[3]

(b) Complete Table 2.1, by predicting the results that you would expect from the experiment shown in Fig. 2.1.

Table 2.1

	A		B	
	water in test-tube	solution in Visking tube	water in test-tube	solution in Visking tube
starch				
reducing sugar				

[4]

(c) Explain your predictions for

(i) the solution in the Visking tube in **B**;

.....

.....

.....

.....[3]

(ii) the water in test-tube **B**.

.....

.....

.....

.....[3]

(d) Suggest three ways in which the experimental method used could be improved to make comparison of the results between **A** and **B** valid.

1. ....
  2. ....
  3. ....
- .....[3]

[Total : 17]

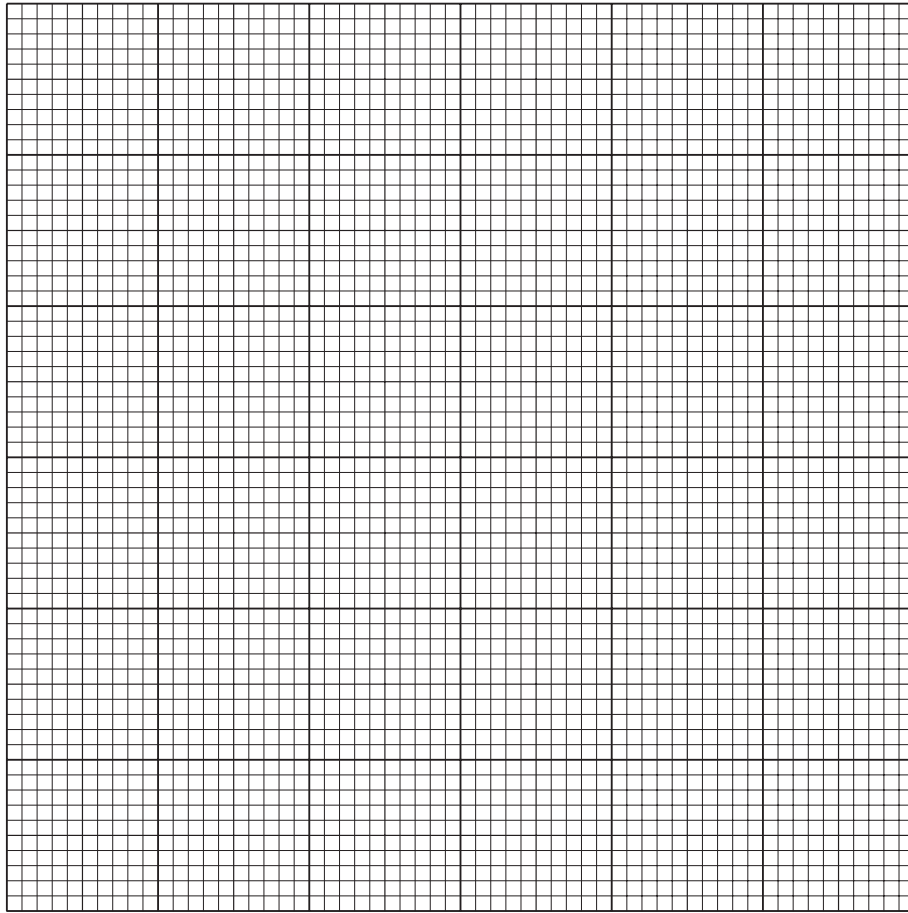
- 3 Two students carried out an experiment using two sharp needles. Student **A** held the needles with the points touching the finger tip of student **B**, so that they could be felt as two separate points. The needle points were then brought closer and closer together, until student **B** felt them as only one point. The distance between the two needle points was then noted. The procedure was repeated at 5 cm intervals from the finger tip.

Their results are recorded in Table 3.1.

**Table 3.1**

distance from finger tip / cm	distance between needle points / mm
0	1
5	3
10	5
15	7
20	missing result
25	14
30	16
35	17
40	20
45	22

(a) Plot a graph of their results on the grid below.



[4]

(b) One result is missing.

Use your graph to suggest what this distance might have been.

.....[1]

(c) What conclusions can you draw from the students' results?

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

(d) Fig. 3.1 is a diagram drawn from a transverse section through a spinal cord.

On Fig. 3.1, draw and label the neurones involved in a reflex arc.

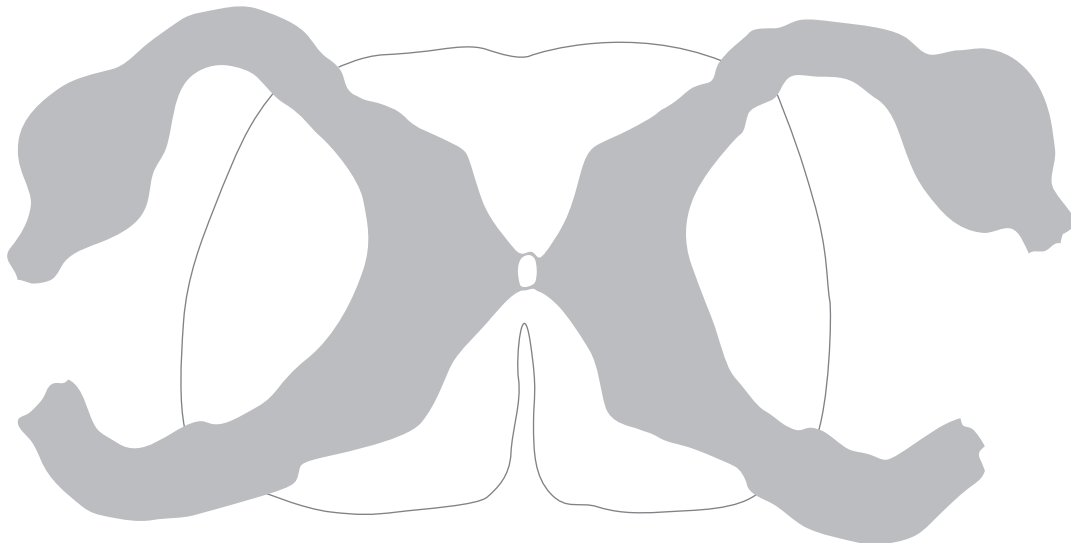


Fig. 3.1

[4]

[Total : 11]