UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8532448656

BIOLOGY **5090/06**

Paper 6 Alternative to Practical **October/November 2009**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

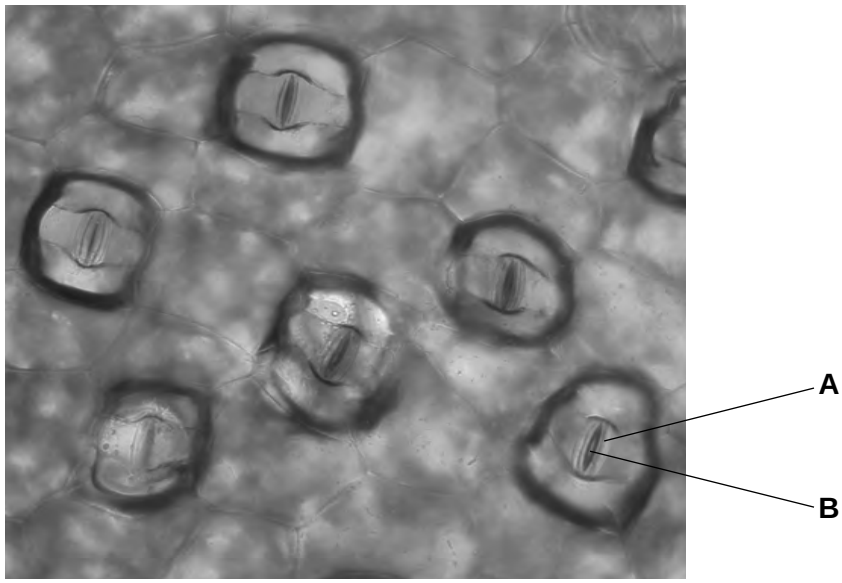
Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.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

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
Total	

This document consists of **8** printed pages.

1 Fig. 1.1 is a photograph of part of the outer layer of a leaf.



×400

Fig. 1.1

(a) Identify the structures labelled **A** and **B**.

A .....

B ..... [2]

Substances that are used, or produced, inside the leaf pass through **B**.

(b) (i) Name one of these substances that passes into the leaf in daylight.

..... [1]

(ii) Name two substances that pass out of the leaf in daylight.

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

(iii) Suggest why there would be no movement in or out in darkness.

.....

..... [1]

(iv) Outline an experiment to demonstrate that one of the two substances that you have named in section **(b)(ii)** passes out of a leaf.

.....

.....

.....

..... [3]

(c) Fig. 1.2 and Fig. 1.3 show two cells from the leaf at different times of the day.

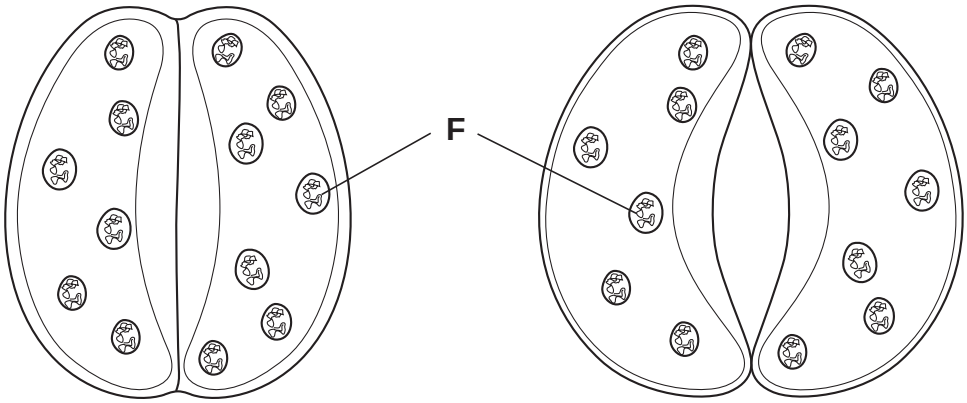


Fig. 1.2 **Fig. 1.3**

(i) The magnification of the cells in Fig. 1.1 is × 400. Calculate the magnification of Fig. 1.2. Show your working clearly.

magnification = ... [3]

(ii) Describe briefly how the cell walls of these cells enable the cells to change shape.

.....

.....

.....

.....

..... [3]

(iii) Name the structures, labelled **F**, that are shown inside the cells.

name of structures .....

If you had prepared a microscope slide to show these cells and their contents, state the name of the reagent you would add to make your preparation show up clearly.

name of reagent ..... [2]

(iv) Suggest how the structures **F** may help to change the condition of the cells in Fig. 1.2 to be like those in Fig. 1.3.

.....

.....

.....

..... [2]

[Total: 18]

2 **(a)** In Table 2.1, the statements concerning food tests may be true or false (untrue).

Indicate in the spaces provided, those that are true (✓) or those that are false (✗).

Table 2.1

statement	test for			
	starch	reducing sugar	protein	fat
heating is required				
when test solution added contents of test-tube are blue				
the test is completed by the addition of water				
positive result of test is contents turning black				
the test can be carried out on a solution of the test material in water				
the material being tested is a carbohydrate				

[6]

(b) **(i)** In which of these tests might a green colour be seen at some stage?

..... [1]

(ii) If the final result is green, what would this indicate?

..... [1]

(c) Explain why it is best to use a water-bath when carrying out one of the tests in Table 2.1.

the test .....

explanation .....

.....

..... [2]

[Total: 10]

3 You need to plan your answer before you start; read and follow the instructions carefully.

Fig. 3.1

(a) (i) Measure, to the nearest mm, and record in the grid provided, the lengths of the 25 bean seeds shown in Fig. 3.1.

[1]

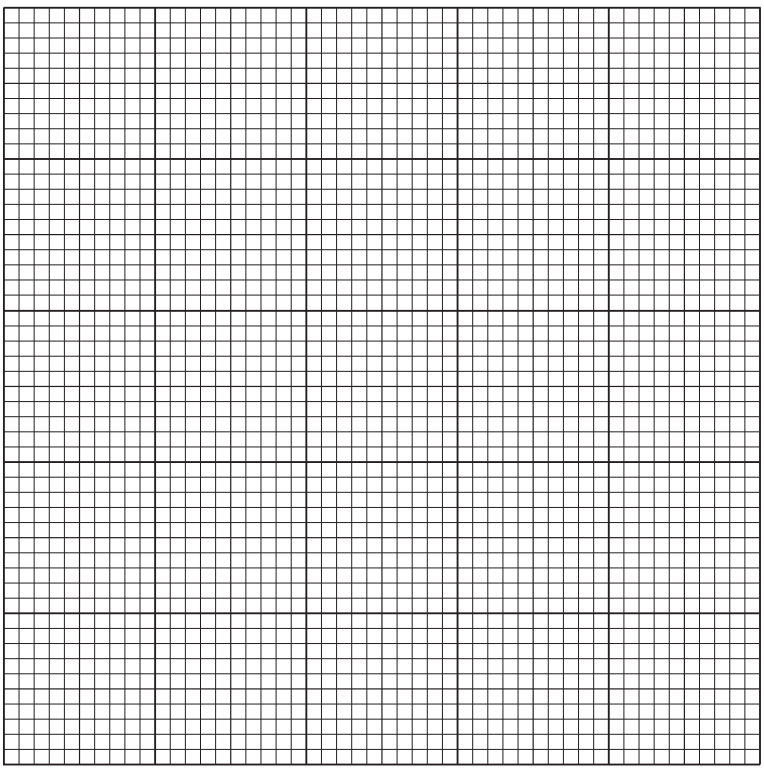
(ii) Using your results, complete Table 3.1.

Table 3.1

length / mm	number of seeds	number of seeds in group
16		
17		
18		
19		
20		
21		
22		
23		
24		

[3]

(iii) Construct a frequency diagram (bar chart or histogram) of the groups in the last column of Table 3.1. [4]



(b) 'Shorter bean seeds are the result of genetic inheritance rather than of the environmental conditions in which the parent plants were grown'.

Outline, giving practical details, an investigation to show if this is true.

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 12]