UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2011**

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.
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 **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.

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

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UNIVERSITY of CAMBRIDGE International Examinations

1 Fig. 1.1 is a photograph of part of a flower.

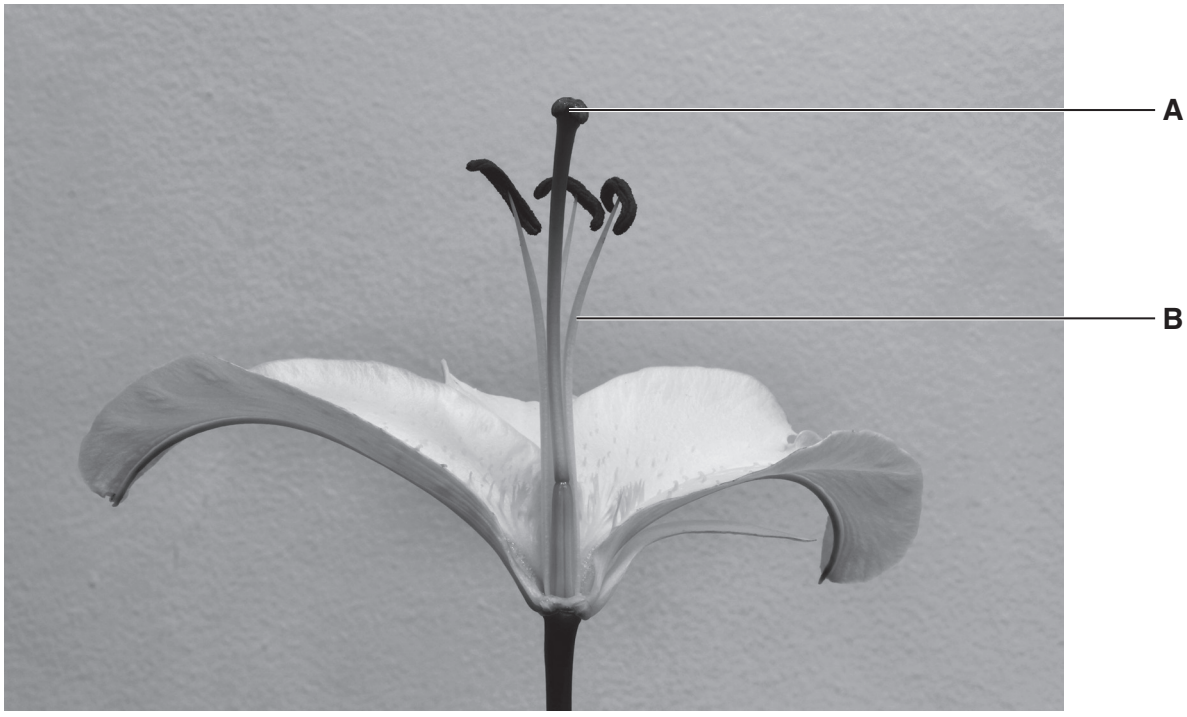


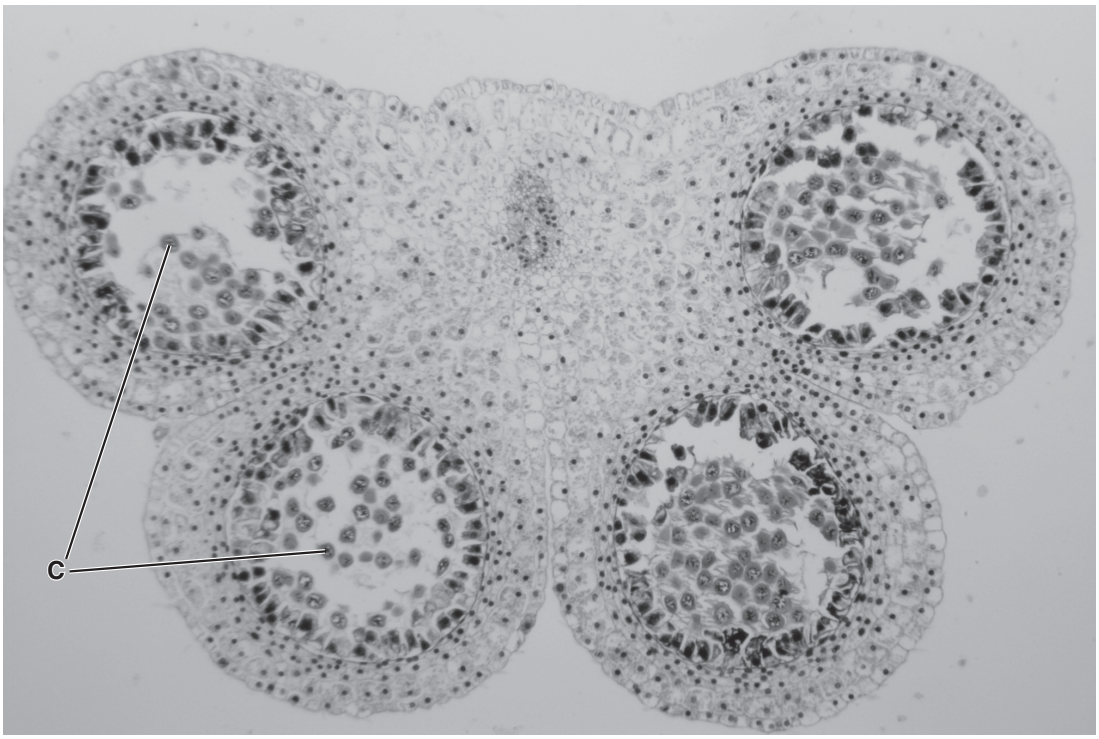
Fig. 1.1

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

A .....

B ..... [2]

Fig. 1.2 is a transverse section through one of the structures in the flower shown in Fig. 1.1.



X60

Fig. 1.2

(ii) Name the type of cell division that occurs to produce structures **C** shown in Fig. 1.2.

..... [1]

(iii) Explain the significance of this type of division in the life cycle of the plant.

.....

.....

..... [2]

(iv) On Fig. 1.1, draw a line labelled X–X to show where the section shown in Fig. 1.2 might have been taken. [1]

(b) (i) Draw a clear outline of the specimen shown in **Fig. 1.2** in the space below. Do not include individual cells. Include the shape of the five distinct internal areas.

[4]

(ii) Calculate the magnification of your drawing compared with the actual size of the specimen from which Fig. 1.2 was taken. Show all working clearly.

length of drawing .....

equivalent length of specimen .....

magnification ..... [4]

(iii) Describe, with practical details, how you would make a stained, temporary slide of pollen from the flower shown in Fig. 1.1.

.....

.....

.....

.....

.....

..... [4]

[Total: 18]

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2 Plant cells may become modified as they grow, in order to perform a special function.

Fig. 2.1 shows a transverse section of a plant organ.

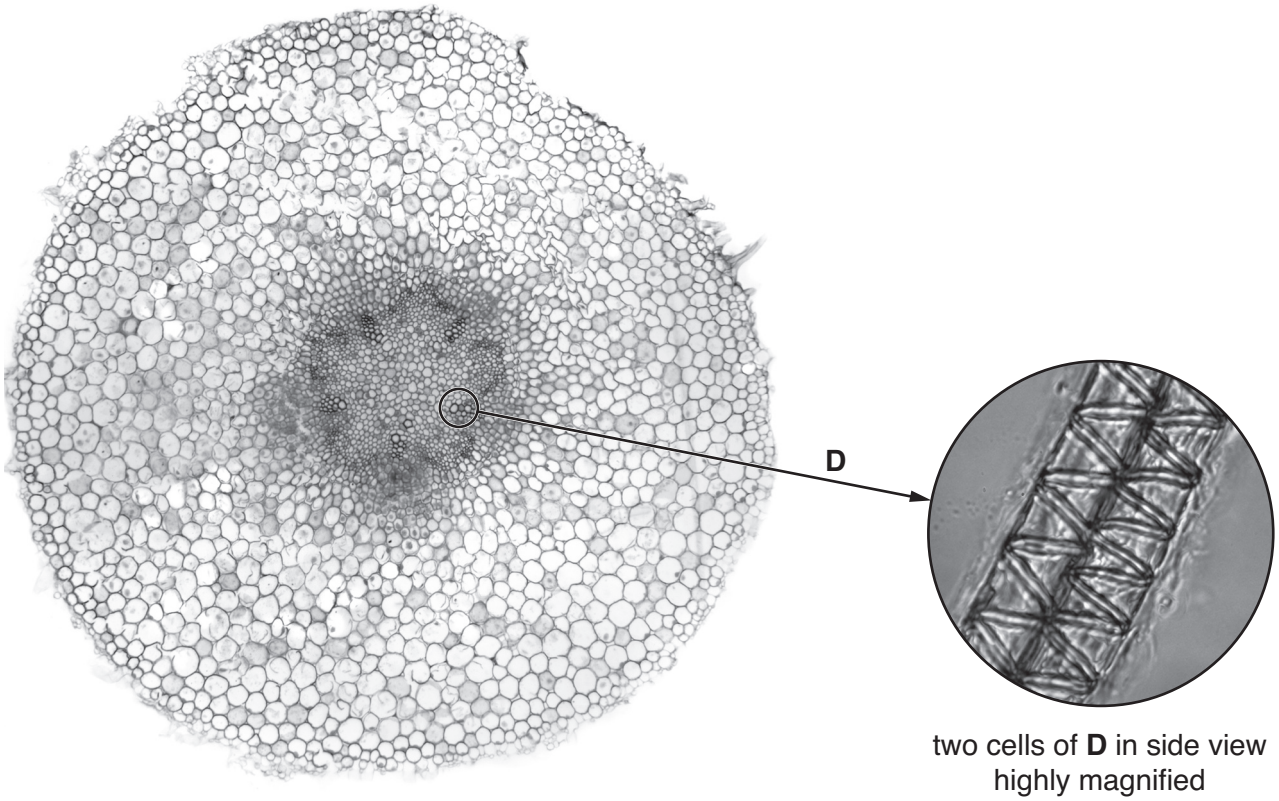

Fig. 2.1

(a) State the name of

(i) the plant organ shown in Fig. 2.1 ..... [1]

(ii) the cell type labelled **D** ..... [1]

(b) **(i)** Describe the part played by cells labelled **D** in Fig. 2.1 in the transport system of a plant.

.....

.....

.....[2]

(ii) Explain how the structure of these cells makes them suitable for this function.

.....

.....

.....[2]

[Total: 6]

3 The body temperature of fish changes with variations in the temperature of the surrounding water and is not controlled by homeostasis.

Many fish eat animals, such as insects, that also have variable body temperatures.

Growth in fish may be measured by recording their length over a period of time. Table 3.1 shows the length of a fish that lives in a part of the world where the water temperature varies from month to month.

The months are indicated by numbers (01 = January, 02 = February, etc).

From October (10) to April (04) the water temperatures are very low.

Table 3.1

year	month	length / mm
2005	08	90
	10	98
2006	04	118
	06	136
	08	177
	10	179
2007	04	198
	06	217

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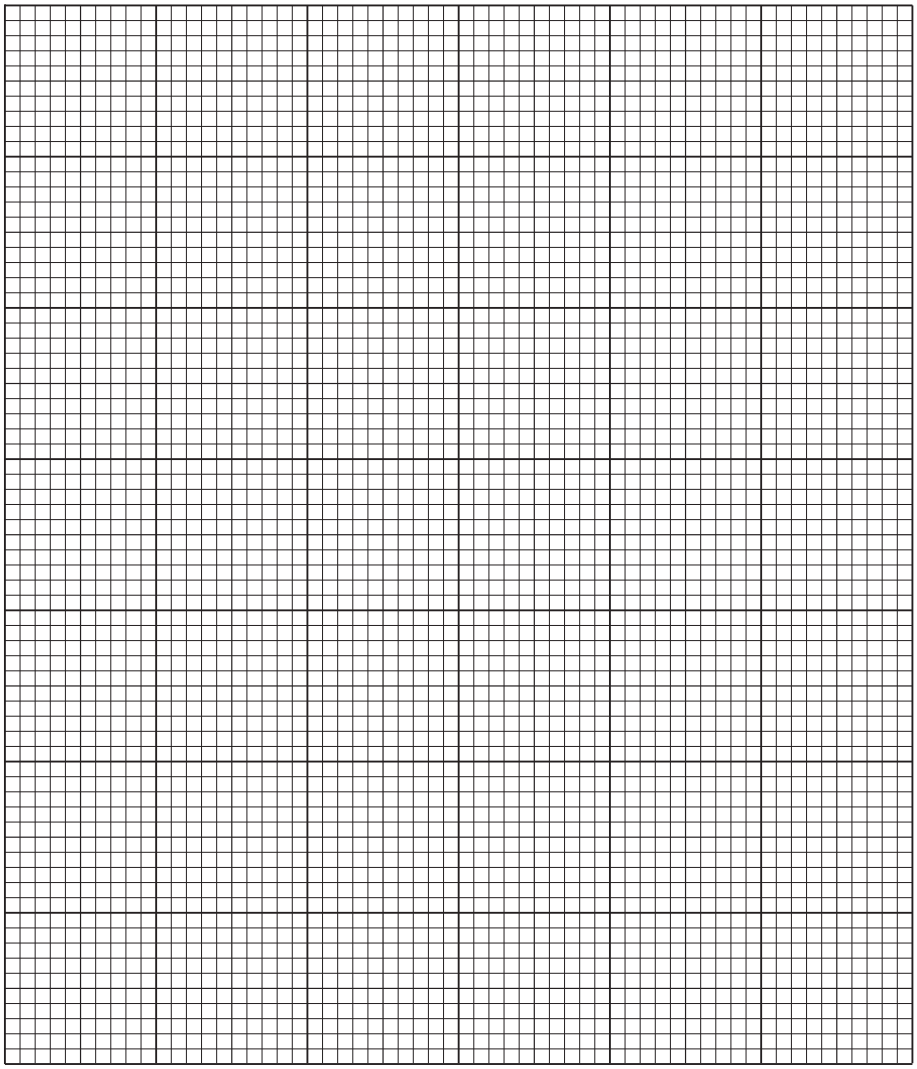
(a) **(i)** Construct a graph by plotting the data in Table 3.1, to a suitable scale on the grid below. Join the plotted points using straight lines.



[5]

(ii) By referring to your graph, suggest during which two month period the fish showed the greatest increase in length.

..... [2]

(iii) State how much the length increased in this time. ..... [1]

(iv) State three features of the pattern of growth that can be seen from your graph.

1. .....

.....

2. .....

.....

3. .....

..... [3]

(b) Suggest how the temperature of the surrounding water could affect

(i) the activity of the fish

.....

.....

.....

..... [3]

(ii) the availability of food for the fish.

.....

.....

.....

..... [2]

[Total: 16]

Copyright Acknowledgements:

Fig. 3.1 © *Broad bean root*; light micrograph; C003/4134.

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