Centre Number	Candidate Number

Candidate Name _____

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Joint Examination for the School Certificate and General Certificate of Education Ordinary Level

BIOLOGY 5090/6

PAPER 6 Alternative to Practical

OCTOBER/NOVEMBER SESSION 2002

1 hour

Candidates answer on the question paper.
No additional materials are required.

TIME 1 hour

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.

Use a sharp pencil for your drawings. Coloured pencils or crayons should **not** be used.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 11 printed pages and 1 blank page.

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

[Turn over

1 Celery is a crop in which the leaf stalks are eaten. Fig. 1.1 shows part of a celery stalk. Using a sharp blade, the stalk was cut along the lines indicated in Fig. 1.1 to a depth of 4 cm. The celery was immersed in water for 30 minutes. Fig. 1.2 shows the appearance of the celery when it was removed from the water.

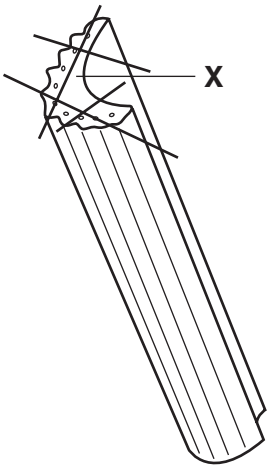


Fig. 1.1

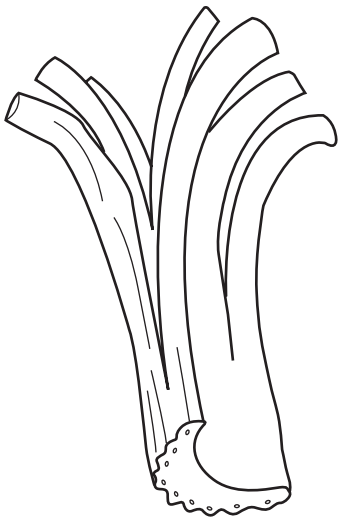
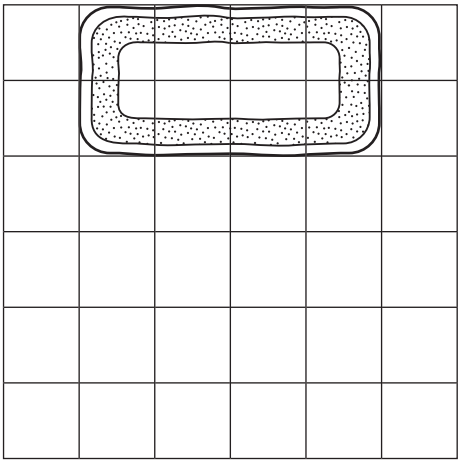


Fig. 1.2

(a) A typical cell from region **X** is drawn as it would appear under the microscope before the celery was immersed in water.

(i) In the space provided on Fig.1.3, draw and label the cell as it would appear after immersion in water for 30 minutes. (The nucleus should **not** be shown.)



cell before immersion in water

cell after immersion in water

[4]

Fig. 1.3

(ii) Explain how the changes that you have drawn in the cell were brought about.

.....

.....

.....

.....[3]

(b) Suggest and explain why the cut stalk curved, rather than just becoming longer.

.....

.....

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.....[3]

(c) Celery can be a beneficial component of a balanced diet.
100 g of fresh celery contains the following:

protein	0.5 g
carbohydrate	0.9 g
fat	0.2 g
fibre	3.3 g

With reference to the information given, state and explain the main nutritional benefit of eating celery.

.....

.....

.....[2]

[Total : 12]

[Turn over

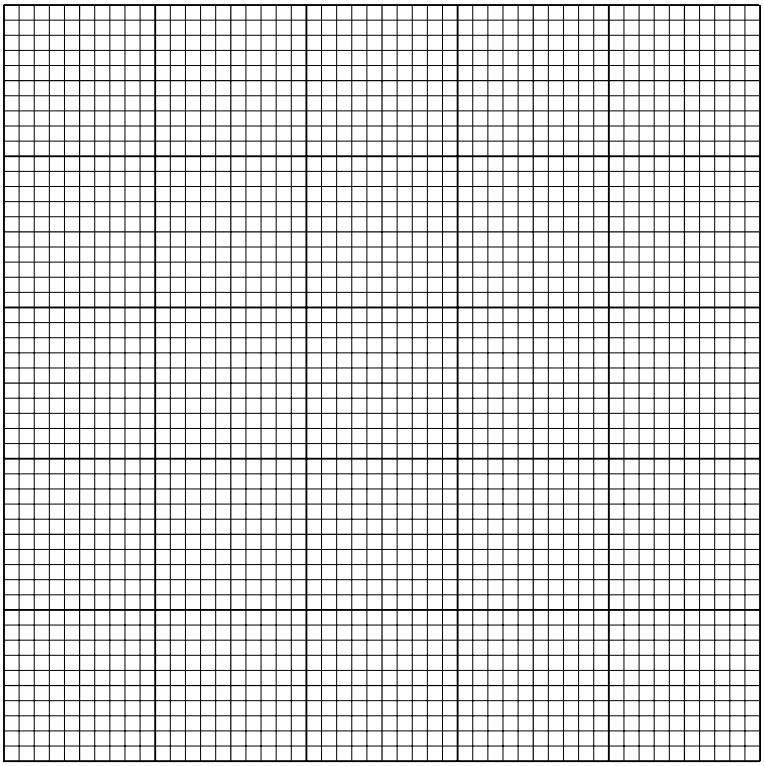
2 Tables 2.1, 2.2 and 2.3 contain information that can be presented in different ways including line graphs, frequency diagrams and pie charts.

Table 2.1 shows the results from an experiment to determine the rate at which an insect larva absorbed oxygen.

Table 2.1

time from start of experiment / min	0	5	10	15	20	25	30	35	40
amount of oxygen absorbed / arbitrary units	0	7	14	21	28	35	39	41	42

(a) (i) Using the data in Table 2.1, construct a line graph on the grid below. Your graph should be fully labelled.



[4]

(ii) Describe and explain the shape of the curve you have drawn.

.....

.....

.....

.....[2]

(iii) From your graph, determine the amount of oxygen that would have been absorbed after 23 minutes.

.....

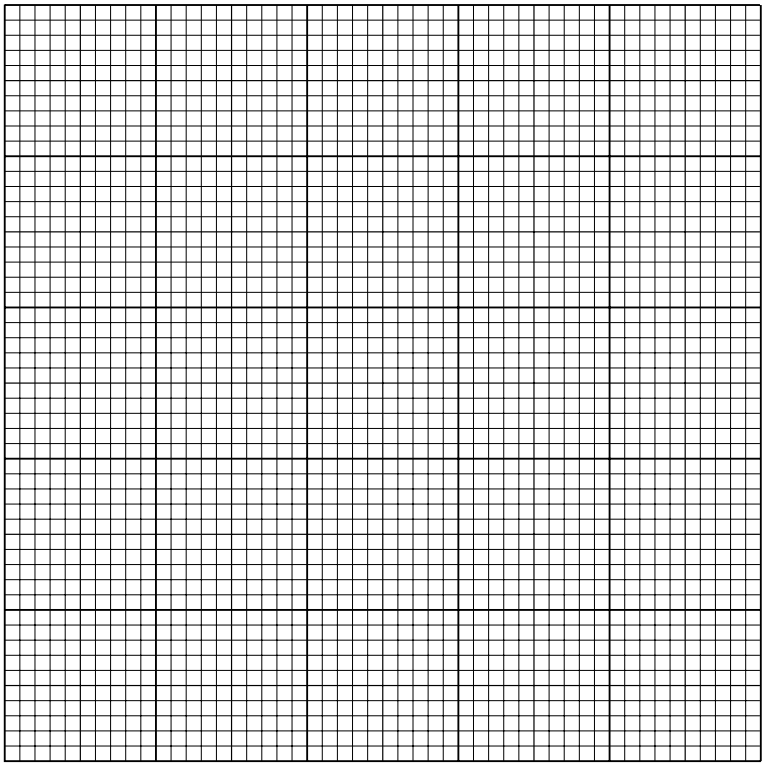
[1]

Table 2.2 shows the results of a survey carried out on a colony of nesting geese to find how many eggs were present in each nest.

Table 2.2

number of eggs in each nest	number of nests
6	4
7	12
8	20
9	36
10	36
11	32
12	16

(b) (i) Present the data in Table 2.2 as a frequency diagram on the grid below. Your frequency diagram should be fully labelled.



[2]

(ii) Describe the pattern of distribution shown by this frequency diagram.

.....

.....

.....[2]

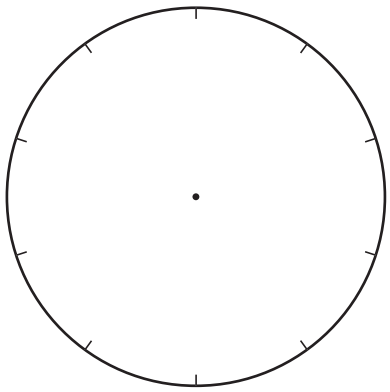
[Turn over

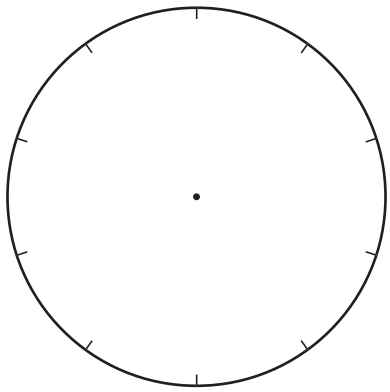
Table 2.3 shows the proportion of each of the main blood groups in two different human populations.

Table 2.3

blood group	frequency in population A (%)	frequency in population B (%)
O	45	30
A	40	50
B	10	12
AB	5	8

(c) Present the contrasting data in Table 2.3 in the form of pie charts in the circular outlines below.





[3]

[Total : 14]

Question 3 starts on page 8.

3 Figs. 3.1 and 3.2 are photographs of compound leaves, each consisting of a number of leaflets.

Fig. 3.1 x 0.5

Fig. 3.2 x 1.0

(a) State three visible features that are shown by **both** leaves.

1. .....

2. .....

3. .....[3]

(b) State three differences shown by the leaves.
(The features should be described for both leaves.)

	Fig. 3.1	**Fig. 3.2**
1.	.....	.....
2.	.....	.....
3.	.....	.....[6]

(c) Suggest **one** way in which the plant shown in Fig. 3.2 might benefit from having spines on the petiole.

.....

.....[1]

[Total : 10]

[Turn over

For Examiner's Use

4 Fig. 4.1 is a photograph showing seeds inside a dry, flat fruit.

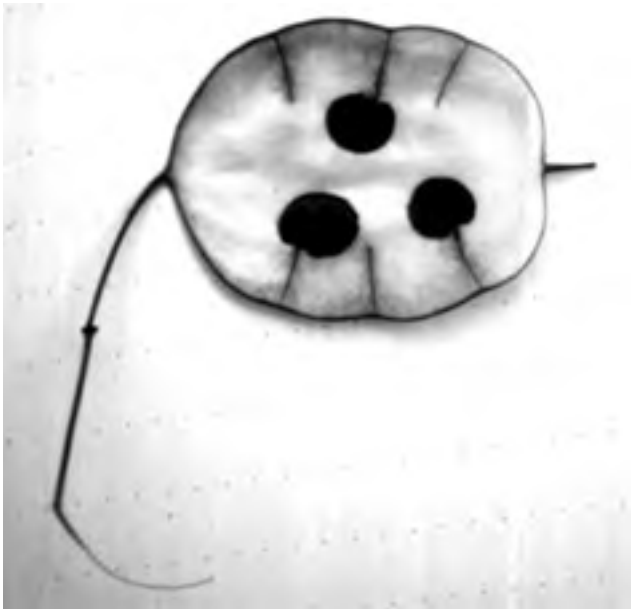


Fig. 4.1 x 1.5

(a) (i) Make a clear, outline drawing to show one of the seeds and its attachment to the fruit. (Labels are **not** required.)

[1]

(ii) Measure the seed in your drawing, and in the photograph, then use these measurements to calculate the magnification of the seed you have drawn, compared with the size of the seed that was photographed.

measurements = ...

Show your working clearly.

magnification = ……..……. [3]

[Total : 4]

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