

Candidate Name _____

Centre Number	Candidate Number

UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

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

BIOLOGY

5090/6

PAPER 6 Alternative to Practical

OCTOBER/NOVEMBER SESSION 2001

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	
TOTAL	

This question paper consists of 7 printed pages and 1 blank page.

Answer **all** the questions.

Write your answers in the spaces provided.

- 1** An experiment was carried out, in the seventeenth century, to investigate plant growth. A large cutting was taken from a tree and, when it had formed roots, was weighed before being planted in a large container. The container was filled with dry soil, of known mass, and was then watered. For the next five years nothing, other than water, was added to the container. At the end of this five-year period the plant was carefully removed from the container and re-weighed. The soil was then dried and re-weighed.

The results are shown in Table 1.1.

Table 1.1

	mass of soil / kg	mass of plant / kg
at beginning of experiment	100.00	0.15
after 5 years	99.95	80.00

It was thought at the time that the loss in mass of the soil was due entirely to experimental error.

- (a) (i)** State how much mass was lost by the soil.

.....[1]

- (ii)** Suggest **one** possible cause of the experimental error suspected by the investigator.

.....[1]

- (iii)** Suggest a possible explanation, other than experimental error, for the loss in mass of the soil.

.....[1]

- (b) (i)** Name the compound, other than water, that was absorbed by the plant, which would account for the increase in mass.

.....[1]

- (ii)** State how this compound entered the cells of the plant.

.....

.....

.....[2]

(c) (i) Name an element, in addition to those that are absorbed in photosynthesis, that is needed for the formation of plant proteins.

.....[1]

(ii) Name another element required by green plants and name a compound in which it is found in green plants.

element required

compound[2]

(d) Suggest an experiment that you could set up to show that the element, referred to in section (c)(i), is essential for normal, healthy plant growth.

.....
.....
.....
.....
.....[4]

[Total : 13]

- 2 Fig. 2.1 shows a number of seeds that are all from the same plant species. The grains are spread on a dark sheet of paper so that they are clearly visible.

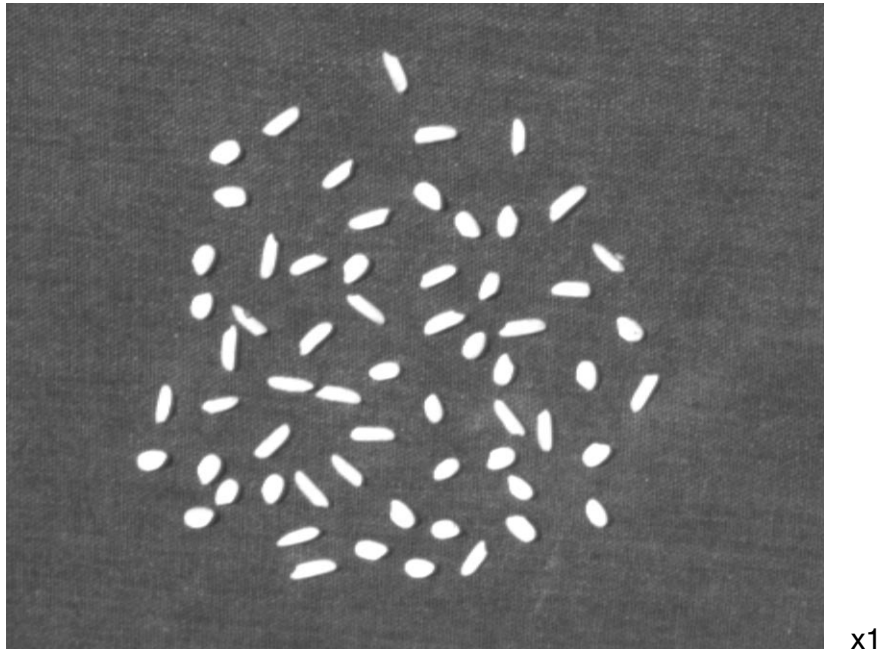


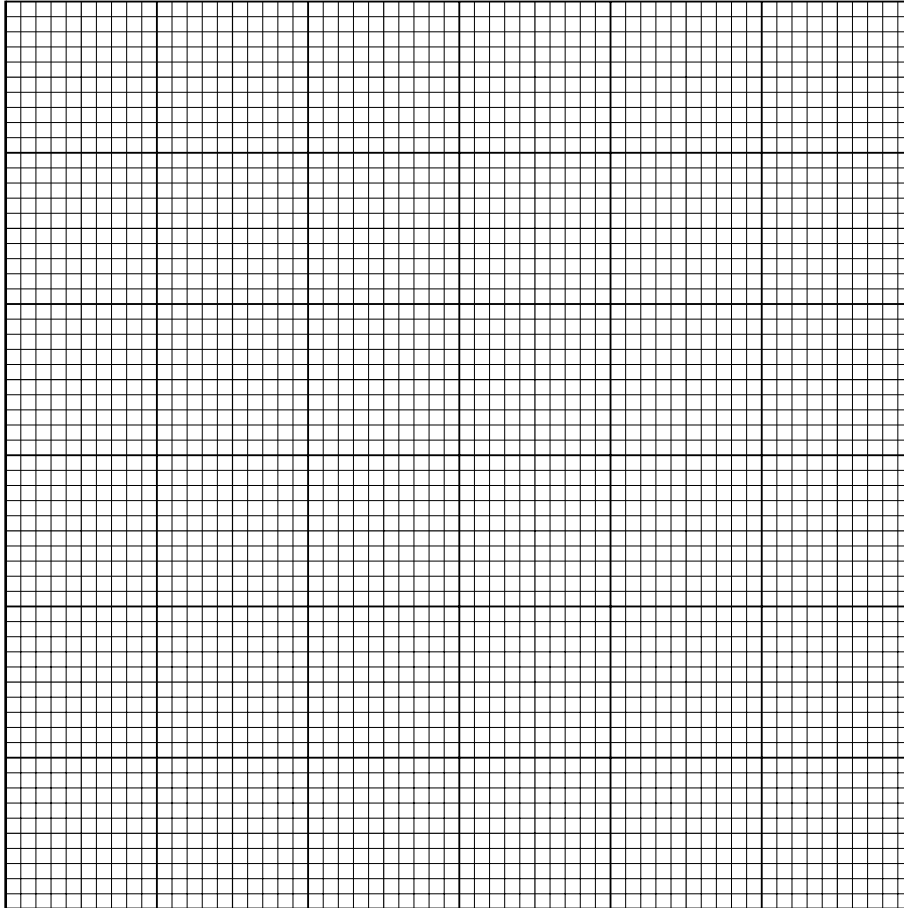
Fig. 2.1

- (a) (i) Measure the length of 40 of the grains, which should be selected at random, to the nearest 0.5 mm and record your measurements.
- (ii) Construct a neat, ruled table to show the distribution of your measurements.

(iii) Describe how you tried to ensure that the seeds you measured were selected at random and were not biased for any particular size or shape.

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

(b) Construct a histogram, on the grid below, using the results in your table.



[4]

(c) (i) Describe the distribution that is shown by your histogram.

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

(ii) Suggest a possible reason for this distribution.

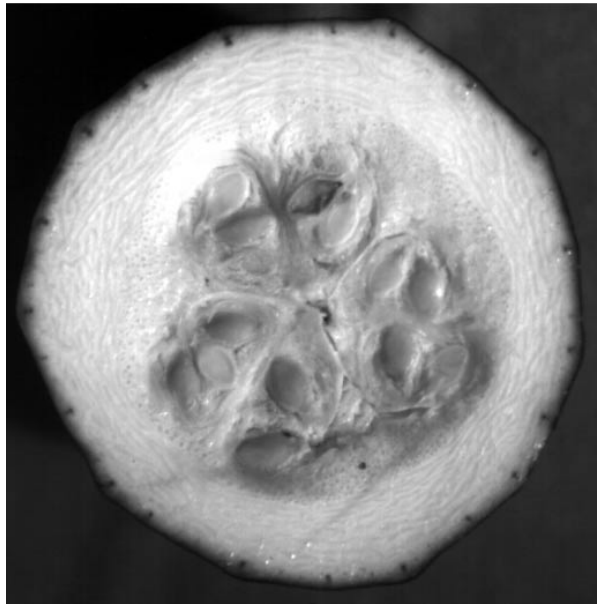
.....
.....
.....[2]

(d) Describe any differences, other than length, in the appearance of the seeds.

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

[Total : 16]

3 Fig. 3.1 is a photograph of a cross-section of a large fruit.



x0.5

Fig. 3.1

(a) In the space below, make a large, labelled drawing of the cross-section of the fruit shown in Fig. 3.1.

[6]

(b) Make a more detailed drawing of **one** of the seeds shown in Fig. 3.1. Labels are **not** required but you should indicate on Fig. 3.1 which of the seeds you have drawn.

[2]

(c) Calculate the magnification of your drawing of the seed compared with the actual size of the seed in the fruit that was photographed. Record the measurements you use. Show your working.

size of seed in Fig. 3.1

size of seed in drawing

magnification =

[3]

[Total : 11]

