

Candidate Name _____

Centre Number

Candidate
Number

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UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

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

BIOLOGY

5090/3

PAPER 3 Practical Test

OCTOBER/NOVEMBER SESSION 2001

1 hour 15 minutes

Candidates answer on the question paper.

Additional materials:

As listed in Instructions to Supervisors

TIME 1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **both** 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	
TOTAL	

This question paper consists of 7 printed pages and a Supervisor's Report.

Instructions to candidates

Question 1 should be started without delay so that there is plenty of time for the experiment to give a clear result.

If, at any time, you are waiting during this question, you are advised to go on to question 2, then return to complete question 1.

- 1 You are provided with a 'stick' of celery, which is approximately 10 cm long.

Remove a thin slice (2 mm approximately) from each end of the stick. Discard these thin slices.

Then cut the stick into two pieces, 6 cm and 4 cm long.

Take the longer piece and, using a scalpel, make cuts down the stick to a distance of 4 cm, in the pattern shown in Fig. 1.1.

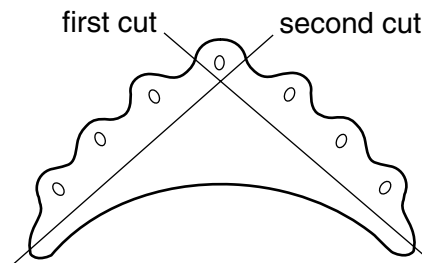


Fig. 1.1

Place the stick in a container of water so that it is completely covered.

Note the time when the stick was placed in the water.

time when placed in water

Wait 20 minutes before removing this stick of celery from the water.

Meanwhile, take the shorter piece, stand it on one end on the tile, then cover the top end with iodine solution. Try not to allow any of the iodine to run down the side of the celery.

After 2-3 minutes, wash off the iodine solution under a tap.

- (a) Using the hand lens, observe carefully the end to which the iodine solution was applied.
 - (i) Make a large, labelled drawing of this end to show details of the structures you can observe.

[5]

- (ii) Calculate the magnification of your drawing, showing clearly where measurements were taken and how they were used in the calculation.

magnification = [4]

When the longer piece of celery has been in the water for 20 minutes, remove it and note the time.

time when removed from water

- (b) Explain how the cut strips of celery became curved.

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.....[5]

Remove and discard the curved pieces and stand the remaining piece vertically on its end, on the tile. Place a few drops of the stain (or ink) on the upper end so that it is covered. Allow it to stand for approximately 3 minutes, then wash off the stain under a tap.

Cut off 1 cm from the upper end where the stain was applied.

Observe the newly exposed surface.

(c) (i) Describe what can be seen and account for your observations.

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.....[2]

Make a vertical cut through the stick in order to expose some of the stained tissue.

(ii) Make a simple drawing of this vertically cut surface, to show the distribution of stain within the celery.

[2]

(iii) State and explain how the structure of the stained tissue could account for this distribution of the stain.

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.....[2]

[Total : 20]

2 You are provided with a number of seeds that are all from the same plant species. Spread the seeds on the dark sheet of paper so that they are clearly visible. Remove any that are damaged or incomplete, then select 40 seeds, at random.

(a) (i) Measure the length of each of the 40 seeds, to the nearest 0.5 mm, and record the measurements.

(ii) Construct a neat, ruled table to show the distribution of your measurements.

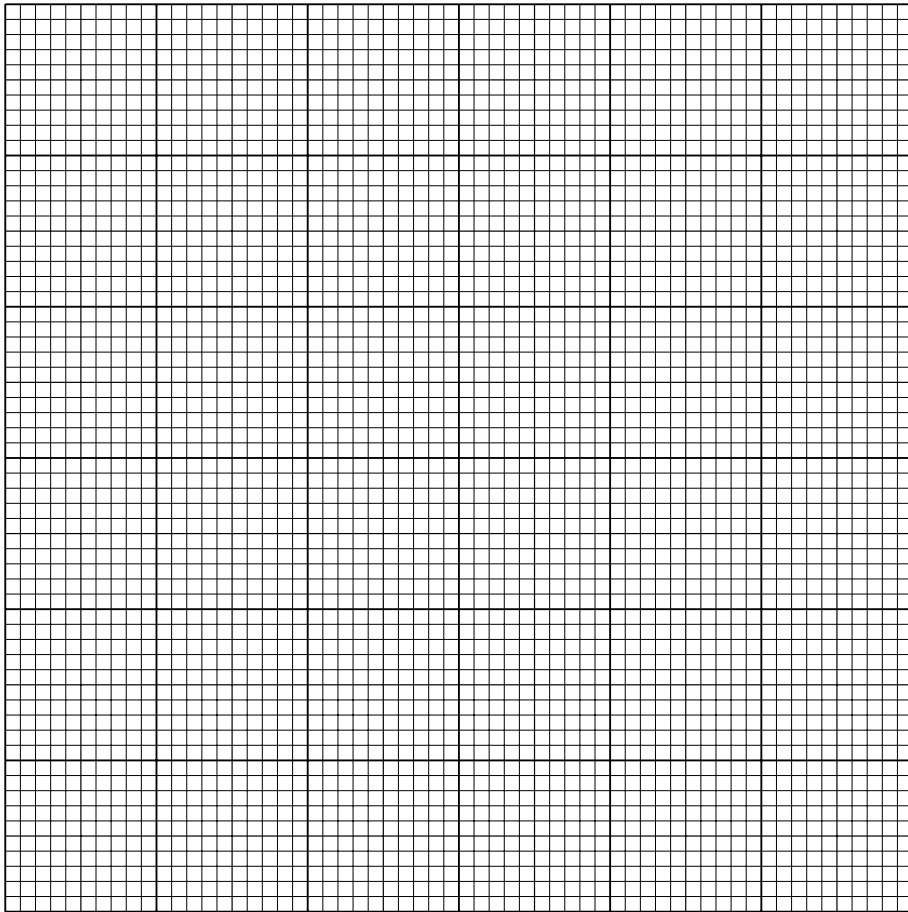
[6]

(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.

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.....[1]

(b) On the grid below, construct a histogram using the results in your table.



[4]

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

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.....[2]

(ii) Suggest a possible reason for this distribution.

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.....[1]

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

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.....[1]

(e) Outline experiments that could be carried out to check the accuracy of your answer to (c)(ii).

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.....[5]

[Total : 20]

SUPERVISOR'S REPORT

**The Supervisor or Teacher responsible for the subject is asked to answer the following questions.*

- 1 Was any difficulty experienced in providing the necessary materials? If so, give brief details.

- 2 Did the candidate experience any difficulty during the course of the examination? If so, give brief details. Reference should be made to
 - (a) difficulties arising from faulty specimens;
 - (b) accidents to apparatus or materials;
 - (c) any information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

Declaration to be signed by the Principal, and completed on the top script from the Centre

The preparation of the practical examination has been carried out so as to fully maintain the security of the examination.

Signed

Name (in block capitals)

***Information that applies to all candidates need only be given once.**

N.B. If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the relevant Supervisor's Results (when requested), the Supervisor's Report and the appropriate seating plan are sent inside each envelope.