

Candidate Name \_\_\_\_\_

Centre Number

Candidate  
Number

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**UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE**  
**General Certificate of Education Ordinary Level**

**BIOLOGY**

**5090/3**

PAPER 3 Practical Test

**MAY/JUNE SESSION 2000**

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

**FOR EXAMINER'S USE**

1	
2	
<b>TOTAL</b>	

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**This question paper consists of 6 printed pages, 1 blank page and Supervisor's Report.**



1 You have been provided with specimen **S31**, a germinated seed.

(a) (i) Examine the specimen with the hand lens.  
Make a large, labelled drawing of **S31** in the space below.

[5]

(ii) Draw a straight vertical line alongside your drawing to show the length of your drawing. Measure this line.

*Length* .....

Measure the length of **S31**.

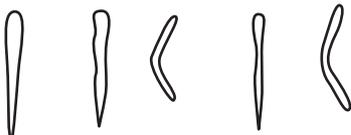
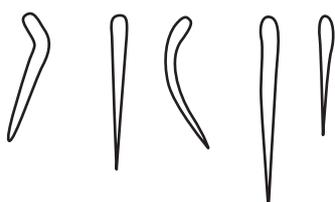
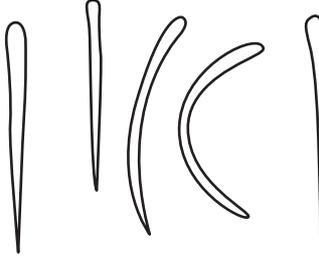
*Length* .....

[2]

(iii) Calculate the magnification of your drawing. Show your working.

*Magnification* .....[2]

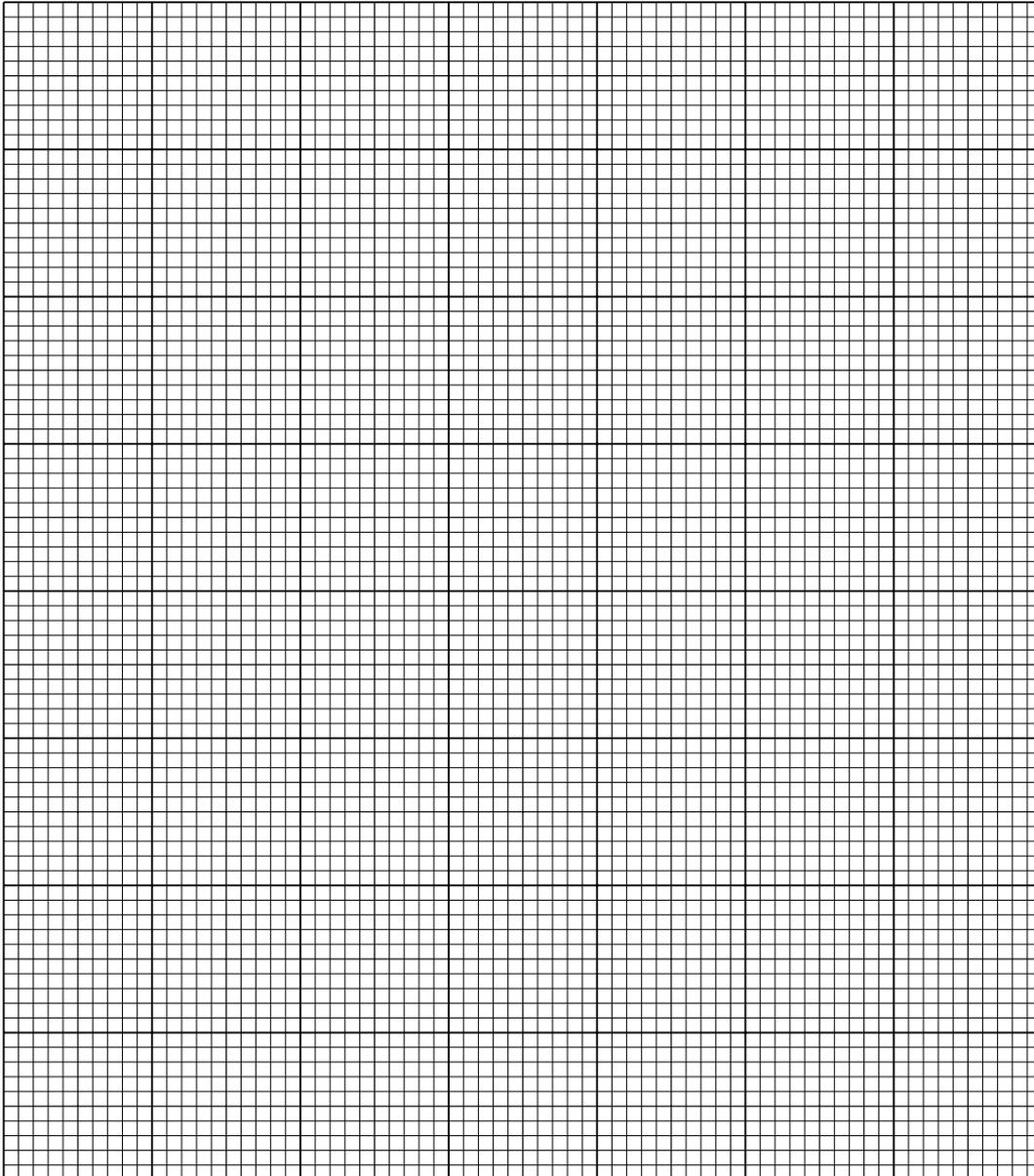
(b) The diagrams below show bean roots that have been grown for the same length of time in different nutrient concentrations.

batch 1	no nutrients						root length (mm)	mean length (mm)		
batch 2	nutrients: 1g per litre						root length (mm)	mean length (mm)		
batch 3	nutrients: 2g per litre						root length (mm)	mean length (mm)		
batch 4	nutrients: 3g per litre						root length (mm)	mean length (mm)		

- (i) Using a ruler and piece of thread, measure the length of each root and record these measurements in the spaces provided.
- (ii) Calculate and record the mean (average) length of each batch of roots.

[5]

(c) On the grid below, plot a graph of mean root length against nutrient concentration.



[4]

(d) Within each batch of roots, there is variation in root length.  
Suggest **two** reasons for this variation.

- 1. ....  
.....
- 2. ....  
.....

[2]

[Total: 20]

- 2 People who suffer from diabetes often have glucose in their urine.  
People who suffer from kidney disease often have protein in their urine.  
People who suffer from liver disease often have bile salts in their urine.

You have been provided with four solutions, **A**, **B**, **C**, and **D**, which represent samples of urine from four different people. It is not known which of these four people are ill. It is known that if they are ill they are suffering from only **one** of the conditions listed above.

You are going to test each 'urine' sample for glucose, protein, and bile salts.

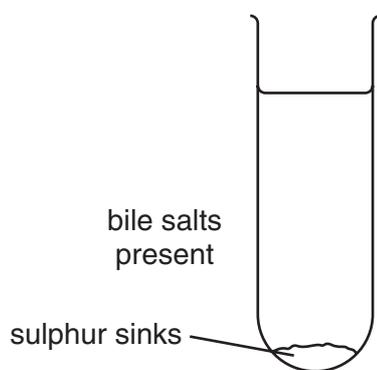
- (a) Describe how you will use Benedict's reagent to test for the presence of glucose.

.....  
.....  
.....[3]

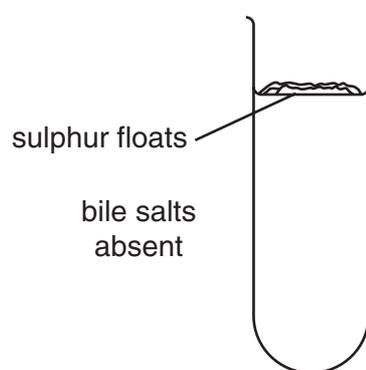
- (b) Describe how you will use the biuret reagent to test for the presence of protein.

.....  
.....  
.....[3]

To test for the presence of bile salts, drop a small quantity of powdered sulphur onto the surface of the solution being tested. If the sulphur sinks (Fig 2.1) bile salts are present. If the sulphur floats (Fig 2.2) bile salts are absent.



**Fig. 2.1**



**Fig. 2.2**

- (c) Carry out the three tests on each of the four samples of 'urine'.  
Record your observations in the table below.

sample	test		
	glucose	protein	bile salts
<b>A</b>			
<b>B</b>			
<b>C</b>			
<b>D</b>			

[10]

- (d) Use your observations to determine the medical condition of each person.  
Record your conclusions in the table below.

person	condition
<b>A</b>	
<b>B</b>	
<b>C</b>	
<b>D</b>	

[4]

[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 particulars.
  
- 2 Did the candidate experience any difficulty during the course of the examination? If so, give brief particulars. 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.
  
- 3 In the space below, please make a drawing of the germinated seed as required of the candidates in Question 1.

*Declaration (to be signed by the Principal, and completed on top script from 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 UCLES 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**.