

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**AGRICULTURE**

**5038/03**

Paper 3 Practical Test

October/November 2005

**1 hour 15 minutes**

Candidates answer on the Question Paper.  
Additional Materials: As listed in Instructions to Supervisors.

**READ THESE INSTRUCTIONS FIRST**

Write your name, Centre number and candidate number in the spaces provided at the top of this page.  
Write in dark blue or black pen in the spaces provided on the Question Paper.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.  
The number of marks is given in brackets [ ] at the end of each question or part question.

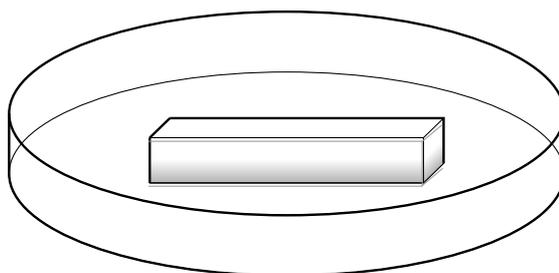
For Examiner's Use	
1	
2	
3	
<b>Total</b>	

Answer **all** the questions.

Write your answers in the spaces provided.

1 You are going to investigate the effect of different concentrations of sugar solution on strips of potato.

- Take five strips of potato. Use a scalpel to make each potato strip 50 mm long.
- Place each strip in the centre of a separate petri dish as shown in Fig. 1.1.



**Fig. 1.1**

- Label the petri dishes and then fill the dish with the solutions as described below.

petri dish number	1	2	3	4	5
solution	0% sugar solution	10% sugar solution	20% sugar solution	30% sugar solution	<b>AS1</b>

- Leave the petri dishes for 30 minutes.

**You are advised to answer question 2 or 3 while this experiment is working.**

- Remove the potato from the petri dish and measure the length of each strip.

**(a)** Record your results below.

petri dish	concentration of sugar solution	length of strip/mm
1	0%	
2	10%	
3	20%	
4	30%	
5	<b>AS1</b>	

[5]

(b) Explain the results you have observed in petri dishes 1 and 4.

dish 1.....  
.....  
.....

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

(c) Why is it important that each potato strip starts the same length?

.....[1]

(d) Suggest, giving a reason for your answer, the concentration of sugar in **AS1**.

concentration ..... %  
reason .....  
.....[2]

[Total: 12]

2 Calcium nitrate is an agricultural fertiliser.

You are going to perform a series of tests to identify which of two agricultural chemicals, **AS1** and **AS3** contains calcium nitrate.

**Table 2.1**

ion	tests	test result
ammonium	add sodium hydroxide solution, gently warm, do not allow to boil	ammonia produced
calcium	add sodium hydroxide solution	white precipitate
carbonate	add dilute hydrochloric acid	fizzing, carbon dioxide produced
nitrate	add sodium hydroxide solution then aluminium foil; warm very carefully. Do not allow to boil	ammonia produced
sulphate	add dilute hydrochloric acid then add barium chloride solution	white precipitate

(a) Describe how you have performed the tests given in Table 2.1 to identify calcium nitrate.

.....

.....

.....

.....

.....

.....

.....[4]

- (b) (i) Describe your results of some of the tests in Table 2.2.

**Table 2.2**

	calcium ion test	nitrate ion test
<b>AS2</b>		
<b>AS3</b>		

[4]

- (ii) From your results, which agricultural chemical contains calcium nitrate.

.....

[1]

- (c) Calcium nitrate is very soluble in water. Suggest an advantage and a disadvantage of this to the farmer.

advantage .....

disadvantage.....[2]

[Total: 11]

- 3 You have been provided with two seeds, **AS4**, which have been soaked in water.
- (a) Carefully remove the outer layer of **one** of the seeds. You may need to use a scalpel to help you, but do not damage the inside.

Make a clear line drawing of the seed showing any structures you can see.

[2]

- (b) Using the scalpel, divide the other seed in half to show all of its internal structures.

Draw a large, labelled drawing of the cut section showing these internal structures.

[5]

[Total: 7]



## 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? 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.
  
- 3 Name of large bean seed species/variety used for **AS4** .....

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

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

Signed.....

Centre Number ..... School .....

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

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