Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

AGRICULTURE **5038/03**

Paper 3 Practical Test

May/June 2004

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.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
1	
2	
3	
Total	

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

Answer **all** the questions.

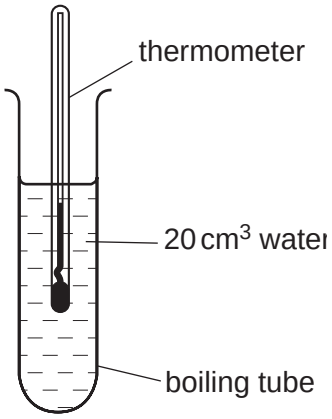
Write your answers in the spaces provided.

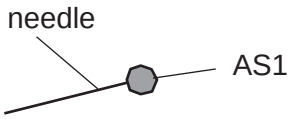
1 **AS1** is an energy providing food for livestock

You are going to find the energy content of **AS1** by burning it.

AS1 has been mounted on a needle for you.

- Place 20 cm^3 of cold water into a clean boiling tube.
- Fasten the boiling tube into place using a clamp stand, boss and clamp.
- Use a second boss and clamp to position **AS1** 4 cm below the boiling tube.





Take the temperature of the water using the thermometer and record it in the table below.

- Loosen the boss holding the needle so that **AS1** can be turned away from under the boiling tube.
- Using a Bunsen burner, heat **AS1** until it will stay alight.
- Carefully replace **AS1** under the boiling tube.
- Gently stir the water using the thermometer, but do not let the thermometer touch the bottom of the boiling tube.

Record the highest temperature of the water.

(a) **(i)** Complete the results table.

	temperature/°C
temperature of water before heating	
highest temperature of water	
temperature rise	

[2]

(ii) Why was the water stirred?

.....

.....[1]

(iii) Why was it important not to touch the boiling tube with the thermometer?

.....

.....

.....[2]

(b) To warm 1 cm^3 of water by 1 °C requires 4.2 joules of energy
To warm 20 cm^3 of water by 1 °C requires 20 x 4.2 joules = 84 joules

Calculate how many joules were released by **AS1** during this experiment. Show your working.

[3]

(c) **AS1** contains much more energy than you were able to measure in this experiment. Suggest two ways in which energy could have been lost in this experiment. For each energy loss, suggest how the experiment could have been improved.

energy loss 1 .....

.....

improvement 1 .....

.....

energy loss 2 .....

.....

improvement 2 .....

.....
[4]

[Total :12]

2 **AS2** and **AS3** are leaves from two plants of the same species.

(a)

- Place **AS2** into a test tube and add enough water to cover the leaf.
- Place the test tube in the water bath.
- After four minutes, carefully remove **AS2** from the test tube, before emptying the water.

Repeat this process with **AS3**.

(i) Suggest how the cells in **AS2** may have been changed by the heating process.

.....

.....[1]

- Replace **AS2** in the test tube and cover **AS2** with ethanol.
- Place the test tube in the water bath and leave it for 15 minutes.

Repeat this process with **AS3**.

You should begin Question 3 while the test tubes are in the water bath.

After 15 minutes, remove the test tube from the water bath and remove **AS2** from the test tube.

Repeat this process with **AS3**.

(ii) Describe how **AS2** has been changed by heating in ethanol.

.....

.....[1]

Rinse **AS2** in water to remove the ethanol and then lay **AS2** on to a white tile.

Repeat this process with **AS3**.

(iii) Describe how **AS2** has been changed by rinsing it.

.....

.....[1]

Cover **AS2** and **AS3** with iodine solution and leave for one minute.

(b) (i) Draw a table to show the results of adding iodine solution.

[3]

(ii) What is your conclusion from these tests?

.....

.....[1]

(iii) Suggest a reason for your conclusion

.....

.....[1]

[Total : 8]

3 **AS4** and **AS5** are two samples of soil.

- Place 1 cm depth of **AS4** into the bottom of a test tube.
- Add about 1 cm depth of barium sulphate powder.
- Add 2 cm depth of distilled water to the test tube and then 2 cm depth of soil pH indicator.
- Shake the test tube so that all the contents are mixed together.
- Note the colour of the mixture in the test tube in the table below
- Let the test tube stand for 2 minutes to allow a coloured solution to appear.
- Compare the colour against a pH chart.

Repeat with **AS5**.

(a) **(i)** Why is it important that distilled water is used rather than tap water?

.....

.....[2]

(ii) Why is the barium sulphate powder added to the test tube?

.....[1]

(iii) Complete the table below with the colour changes and the pH of each sample.

Sample	**AS4**	**AS5**
colour of mixture before settling		
colour of solution after settling of mixture		
pH of sample		

[4]

(b) **(i)** How can soils be treated to reduce their acidity?

.....[1]

(ii) How can soil acidity reduce the yield of a crop?

.....

.....[2]

[Total : 10]

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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 Identity of plant leaf used in question 2. (**AS2/3**) .....

pH of soil **AS4** ..... pH of soil **AS5** .....

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.**