



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

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**AGRICULTURE**

5038/03

Paper 3 Practical Test

May/June 2010

CONFIDENTIAL INSTRUCTIONS

1 hour 15 minutes

**Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.**

**READ THESE INSTRUCTIONS FIRST**

These instructions give details of the apparatus, reagents and specimens required by each candidate for each experiment in this paper. A summary of the questions that will be presented to candidates is included, where appropriate, to allow the teacher to test the apparatus appropriately. **No access to the question paper is permitted in advance of the examination.**

It is assumed that the ordinary apparatus of a science laboratory will be available, including a supply of purified water (distilled or deionised).

If arrangements are made for different sessions for different groups of candidates, care must be taken to ensure that the different groups of candidates are effectively isolated so that **no information passes between them.**

**All specimens should carry only the code letters and numbers as indicated and their identity should not be revealed to the candidates.**

Supervisors should ensure that all specimens have the correct identity attached to the specimen and that these are **not** removed during the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant:

**C** = corrosive substance

**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

If you have any problems or queries regarding these Instructions, please contact CIE

by e-mail International@cie.org.uk

by phone +44 1223 553554

by fax +44 1223 553558

stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **3** printed pages and **1** blank page.



\* 0 6 5 9 4 6 3 9 7 0 \*

All specimens/materials should carry only the letters/numbers as indicated and their identity should not be revealed to the candidates.

Supervisors should ensure that all specimens have the correct identity attached to the specimens and that these are not removed or altered during the examination.

Specimens and apparatus should be provided as follows.

- 1 Soil **AS1** needs to be approximately:
- |                         |   |                                            |
|-------------------------|---|--------------------------------------------|
| 50 % coarse sand        | } | proportions by volume<br>mix together well |
| 30 % fine sand          |   |                                            |
| 20 % sieved garden soil |   |                                            |

Test the soil for its pH and adjust by adding powdered citric acid to obtain a pH of between 4.0 and 5.0.

- Soil **AS2** needs to be approximately:
- |                                   |   |                                            |
|-----------------------------------|---|--------------------------------------------|
| 20 % clay                         | } | proportions by volume<br>mix together well |
| 70 % fine sieved garden soil      |   |                                            |
| 10 % peat or other organic matter |   |                                            |

Test the soil for its pH and adjust by adding powdered chalk or hydrated lime to raise the pH to between 7.5 and 8.0.

If these soils prove difficult to source, **AS1** needs to be a free draining soil with a pH of 4.0 – 5.0, and **AS2** needs to be a heavy poorly drained soil with a pH of 7.5 – 8.0.

NB Remember to record the final pH of each sample on the Supervisor's Report on the back of the first question paper.

Each candidate will need:

- 300 cm<sup>3</sup> of soil **AS1**
- 300 cm<sup>3</sup> of soil **AS2**
- 250 cm<sup>3</sup> beaker with 200 cm<sup>3</sup> line clearly marked with a water-resistant marker pen
- 100 cm<sup>3</sup> measuring cylinder
- two boiling tubes with bungs or corks
- barium sulfate (for soil testing)
- soil indicator (Universal Indicator can be used if soil indicator is unavailable BUT please note on Supervisor's Report)
- distilled or deionised water
- test colour chart for indicator used
- water-resistant marker pen
- boiling tube rack
- ruler

- 2 Three feed supplements and two animal feeds should be prepared as shown in the table below.

	labelled	contents
feed supplement	<b>AS3</b>	plain flour
feed supplement	<b>AS4</b>	plain flour with a trace of glucose powder sufficient to give a green colour when tested for glucose with Benedict's solution
feed supplement	<b>AS5</b>	plain flour and glucose powder 50/50 mix to give a clear brick red-colour when tested for glucose with Benedict's solution
animal feed	<b>AS6</b>	small pieces of chopped Irish potato
animal feed	<b>AS7</b>	tomato flesh with seeds removed or marrow flesh if tomato unavailable (please note which is used on Supervisor's Report.)

NB The candidates need to be able to recognise **AS6** and **AS7** as slices of whole food (not mashed).

Each candidate will need:

- 10 cm<sup>3</sup> of each feed supplement, **AS3**, **AS4** and **AS5**
  - three boiling tubes
  - boiling tube rack
  - a white tile or chopping board
  - Benedict's solution
  - distilled or deionised water
  - iodine solution (for food testing)
  - a scalpel
  - water-resistant marker pen
  - a small slice of each animal feed, **AS6** and **AS7** (approx 2 cm<sup>3</sup>)
  - ruler
  - access to a water bath at 95 °C
  - a stop clock or stopwatch (capable of timing 10 minutes)
- 3 Each candidate will need access to a **clean** spark plug (for a four-stroke engine) with its washer and gasket labelled **AS8**.

There should be one spark plug between 5 candidates.

