



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

AGRICULTURE

5038/31

Paper 3 Practical Test

October/November 2011

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

H = harmful or irritating substance

T = toxic substance

F = highly flammable substance

O = oxidising substance

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

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by fax +44 1223 553558

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

This document consists of **2** printed pages.



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 specimen and that these are not removed or altered during the examination.

Specimens and apparatus should be provided as follows.

1 Each candidate will need access to:

- **AS1** any weed with a tap root, ideally rosette leaf structure or hairy waxy leaves. For example, a species of plantain (*Plantago*) or hawkweed (*Hieracium*) would be suitable.
- **AS2** any weed with clearly defined rhizomes. For example, a grass species such as couch grass (*Elytrigia repens*) would be suitable.

2 Each candidate will need:

- starch powder labelled **Feed AS3** (approximately 10g per candidate)
- a mixture of approximately equal amounts of starch powder, glucose powder and albumen, labelled **Feed AS4** (approximately 10g per candidate) [alternatively a mixture of food materials, that will give a positive result for starch, glucose and protein, can be used]
- spatula
- Benedict's solution in a dropper bottle labelled *Benedict's solution*
- 4 dry, clean test tubes
- access to a water bath at 90° C
- white tile
- iodine solution in a dropper bottle labelled *iodine solution*
- copper sulfate solution in a dropper bottle labelled *copper sulfate solution*
- sodium hydroxide solution in a dropper bottle labelled *sodium hydroxide solution*
- test tube rack
- marker pen suitable for labelling test tubes
- ruler

3 Each candidate will need:

- a sealed bag containing 18g of **dried** soil with a pH of 7–9, ideally pH8 labelled **AS5**
- a sealed bag containing 15g of a different **dried** soil which is more sandy with a pH of 4–5 labelled **AS6**
(The two soils need to be dried, to remove all water, before the samples are weighed. Accurate weighing of the soil samples is very important.)
- access to a 1dp balance
- 2 dry, clean test tubes
- 2 corks or bungs to fit test tubes
- spatula
- barium sulfate for soil tests labelled *barium sulfate*
- deionised or distilled water
- soil indicator solution in a dropper bottle labelled *soil indicator solution*
- test tube rack
- marker pen suitable for labelling test tubes
- pH colour chart
- ruler

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