

**International General Certificate of Secondary Education  
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**COMBINED SCIENCE**

**0653/5**

PAPER 5 Practical Test

CONFIDENTIAL INSTRUCTIONS

**MAY/JUNE SESSION 2002**

1 hour 30 minutes

**Great care should be taken that this confidential information does not reach the candidates either directly or indirectly.**

**The Supervisor's attention is drawn to the form on page 5 which must be completed and returned with the scripts.**

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**These instructions consists of 5 printed pages and 3 blank pages.**

### Instructions for preparing apparatus

These instructions detail 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 the candidates is included, where appropriate, to allow the teacher to test the apparatus appropriately. **No access is permitted to the question paper in advance of the examination session.**

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.**

### For Question 1

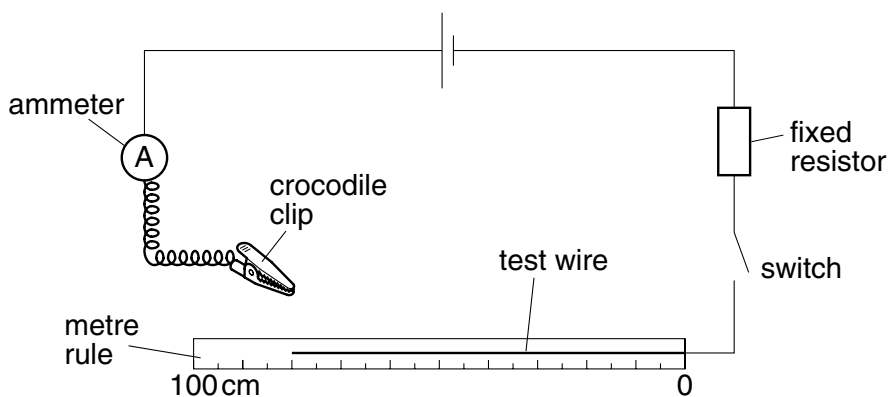
*Each candidate will require:*

- (i) three test-tubes 125 mm x 15 mm, one of which should be made of hard glass;
- (ii) a large test-tube 150 mm x 25 mm;
- (iii) some Universal Indicator solution;
- (iv) about 20 cm<sup>3</sup> of dilute hydrochloric acid, concentration about 1 mol dm<sup>-3</sup>;
- (v) limewater and means of testing for carbon dioxide;
- (vi) a Bunsen burner;
- (vii) about 3 g of potassium hydrogencarbonate, labelled 'P';
- (viii) a 0–110 °C thermometer.

## For Question 2

Each candidate will require:

- (i) a 1.5 V cell in a holder (or with means to connect it into a circuit). The voltage of the cell is to be given to candidates;
- (ii) 4 connecting wires, two of which should terminate with crocodile clips at one end;
- (iii) a switch;
- (iv) 0.8 m length of wire which has a resistance of approximately 12 ohms per metre, attached to a metre rule with one end of the wire at the zero mark, (see diagram). All candidates should be provided with wire of the same type;
- (v) a fixed resistor between the cell and zero end of the test wire. This is to protect the ammeter when the length of test wire approaches zero. A 1 ohm resistor should be suitable. The value of this resistor must be recorded in the report;
- (vi) a 0–1 A ammeter. It is important to make sure that with 10 cm of wire in the circuit, the reading is on the scale. If there is difficulty in providing 0–1 A ammeters, it is permissible to alter the voltage of the cell provided, the resistance of the fixed resistor and/or of the wire to suit the available ammeters. Any such alterations must be recorded on the appropriate sheet.
- (vii) The apparatus should be set up for candidates as shown in the diagram below.



**For Question 3****Instructions for preparation**

Several dishes of seeds should be sown in preparation for this practical. A fast-growing type of seed should be used. Mustard or cress are ideal. They should be prepared a few days in advance. The aim is to get seedlings about 2–3 cm high in dish **A** with well-developed leaves showing. There should be little or no growth in dish **C**. This should take about 4 days, but will vary according to the temperature. A trial is advised to assess the suitability of the seeds and growing times. The dishes should show the growth patterns indicated in the note for Supervisors.

The seeds should be grown on cotton wool or absorbent paper in shallow containers, e.g. petri dishes. There should be the same number of seeds in each dish, at least 20, spread out evenly. The dishes should all be kept in identical temperatures, and illuminated identically and evenly. If light comes from one side the dishes should be turned regularly.

*Each candidate will require:*

- (i) 3 dishes labelled **A**, **B** and **C**. Two or three candidates may share one set of dishes between them. They should all be grown identically as described except:  
Dish **A** should be watered using distilled or deionised water,  
Dish **B** should be watered using a solution made up by adding 0.3 cm<sup>3</sup> of 1 M sulphuric acid to 1 litre of distilled water,  
Dish **C** should be watered using a solution made up by adding 1.0 cm<sup>3</sup> of 1 M sulphuric acid to 1 litre of distilled water.  
Solutions for **B** and **C** must be made up accurately. A 1.0 cm<sup>3</sup> syringe or pipette should be used.
- (ii) a pair of forceps;
- (iii) a ruler (15 cm length will do).

**Note for Supervisors:**

|               |   |
|---------------|---|
| Dish <b>A</b> | good germination and growth,                                |
| Dish <b>B</b> | seeds germinated but growth either reduced or non-existent, |
| Dish <b>C</b> | some germination but no growth.                             |

*Information required from the Supervisor:*

**The Supervisor is asked to carry out the experiments and to enter the results on a spare copy of the examination paper, clearly marked ‘Supervisor’s Results’ and showing the Centre number. This should be returned with the scripts. Failure to do so may cause the candidates to be penalised.**

**This form must be completed and returned in the envelope with the scripts together with the seating plan and the Supervisor's Results mentioned below.**

**May/June 2002**

*General*

The Supervisor is invited to give details of any difficulties experienced by particular candidates giving their names and candidate numbers. These should include reference to:

- (a) difficulties due to faulty apparatus;
- (b) accidents to apparatus or materials;
- (c) physical handicaps, e.g. short sight, colour blindness;
- (d) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;
- (e) any help given to a candidate.

*The Supervisor is asked to supply the following information:*

Plan of work benches, giving details by candidate numbers of the places occupied by the candidates for each session and a copy of the 'Supervisor's Results'.

NAME OF CENTRE .....

SIGNED .....

*Supervisor*

CENTRE NUMBER .....

DECLARATION (to be signed by the Principal)

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

NAME .....

(in block capitals)

SIGNED .....(Principal)





