



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

---

**CO-ORDINATED SCIENCES**

**0654/51**

Paper 5 Practical Test

**October/November 2010**

CONFIDENTIAL INSTRUCTIONS

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

---

**The Supervisor's attention is drawn to the form on page 8 which must be completed and returned with the scripts.**

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

by e-mail: [International@cie.org.uk](mailto:International@cie.org.uk)

by phone: +44 1223 553554

by fax +44 1223 553558

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

---

This document 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) 20 cm<sup>3</sup> of the following solutions labelled as follows:  
a solution of sodium chloride, concentration about 0.1 mol dm<sup>-3</sup>, labelled **A**  
1% starch solution, labelled **B**  
1% amylase solution, labelled **C**  
a solution of glucose, of concentration about 0.1 mol dm<sup>-3</sup>, labelled **D**  
1% albumen, labelled **E** ;
- (ii) 12 test-tubes, size 125 x 15 mm. If fewer test-tubes are available there should be means to wash used ones ;
- (iii) a test-tube rack ;
- (iv) a dropping pipette and means to wash it out ;
- (v) 30 cm<sup>3</sup> biuret solution, labelled **biuret** solution ;
- (vi) 20 cm<sup>3</sup> iodine solution, labelled **iodine** solution;
- (vii) 20 cm<sup>3</sup> Benedict's solution, labelled **Benedict's** solution;
- (viii) a very hot water bath, just below boiling point, and the means to support test-tubes inside. Several candidates may share the same water bath without overcrowding ;
- (ix) a stopclock or sight of a wall clock ;

The amylase solution should be freshly made up and tested before the practical as follows:

Put equal volumes of amylase and starch solutions into a test-tube and leave at room temperature for 5 minutes. The mixture should give a positive reaction when tested with Benedict's solution. If room temperature is likely to be less than 20 °C then candidates should be told to warm the mixture in part (d) in **Question 1**.

Candidates should have access to extra solutions without penalty.

**For Question 2**

*Each candidate will require:*

- (i) a power source of approximately 1.5V – 2.0V ;
- (ii) 2 similar lamps of the same rating in suitable holders: any low voltage lamps will be suitable, provided they glow when connected in series and parallel with the power supply ;
- (iii) a switch ;
- (iv) an ammeter with full scale deflection 0.5A or 1.0A ;
- (v) a voltmeter with full scale deflection 1.5V or 3.0V ;
- (vi) sufficient connecting leads to construct a circuit with two lamps in series. Candidates will be required to dismantle this and reconnect the lamps in parallel. Both circuits will also require the ammeter and voltmeter to be connected.

Note: The candidates will be required to connect the circuits unassisted. If help is required, it may be given but the candidate number must be noted on the Supervisor's report.

If more than one sitting is necessary, ensure that the circuit is completely disconnected before allowing the candidates to begin.

**For Question 3**

*Each candidate will require:*

- (i) one hard glass test-tube 125 x 15 mm. Candidates should be told which tube this is ;
- (ii) a test-tube holder ;
- (iii) a Bunsen burner ;
- (iv) seven test-tubes, size 125 x 15 mm. If fewer are provided there should be the means to wash used ones ;
- (v) about 3 g of iron(II) ammonium sulfate, labelled 'compound **X**'. This should be a fresh sample ;
- (vi) a filter paper and a funnel ;
- (vii) a supply of litmus paper ;
- (viii) a dropping pipette ;
- (ix) access to the following solutions will be required labelled as such:

about 5 cm<sup>3</sup> aqueous **sodium hydroxide**, concentration about 1.0 mol dm<sup>-3</sup>  
about 2 cm<sup>3</sup> aqueous **copper sulfate**, concentration about 0.25 mol dm<sup>-3</sup>  
about 2 cm<sup>3</sup> **hydrochloric acid**, concentration about 1.0 mol dm<sup>-3</sup>  
about 2 cm<sup>3</sup> aqueous **barium chloride**, concentration about 0.1 mol dm<sup>-3</sup>  
about 2 cm<sup>3</sup> aqueous **silver nitrate**, concentration about 0.05 mol dm<sup>-3</sup>  
about 2 cm<sup>3</sup> **nitric acid**, concentration about 1.0 mol dm<sup>-3</sup>.

Spare materials and equipment should be available and can be provided without penalty. **Candidates should be made aware of this.**

*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 on page 4.**

**October/November 2010**

*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 this practical examination has been carried out so as to maintain fully the security of the examination.

NAME .....  
(in block capitals)

SIGNED ..... (Principal)



Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.