



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**COMBINED SCIENCE**

**0653/52**

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.**

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**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.

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This document consists of 7 printed pages and 1 blank page.



### 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) and either a watch or sight of a clock with second hand.

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) approximately 40 g solid protein. The easiest way to supply this is to hard-boil a hen's egg of medium size and then remove the yolk. One egg per candidate will be enough. An alternative source of solid protein may be used if this is unavailable. The protein should be broken down by **juice 1** below when incubated for 10 mins at approximately 45 °C. The protein should not melt at this temperature. Therefore gelatine is **not** suitable ;
- (ii) a chemical balance capable of reading to 0.1 g. The balance may be used by several candidates ;
- (iii) 4 large test-tubes size 150 x 25 mm ;
- (iv) test-tube rack or beaker to support the tubes ;
- (v) labels or marker pen ;
- (vi) 1 large beaker (600 cm<sup>3</sup>) and access to hot water to prepare a waterbath ;
- (vii) a thermometer (0 – 100 °C)
- (viii) scalpel or sharp knife ;
- (ix) a white tile ;
- (x) a spatula ;
- (xi) paper towels or kitchen paper ;
- (xii) a beaker for pouring waste juice labelled **waste juice** ;
- (xiii) measuring cylinder or syringe to measure 20 cm<sup>3</sup> volume ;
- (xiv) a stopclock or sight of a wall clock ;
- (xv) approximately 25 cm<sup>3</sup> of each of four different fruit juices, **juice 1**, **juice 2**, **juice 3** and **juice 4**.
  - label **juice 1** citrus (or lemon, orange etc.),
  - label **juice 2** pineapple (or mango),
  - label **juice 3** apple,
  - label **juice 4** whatever other suitable fruit juice is used.

**Please turn over for instructions to prepare the juice.**

**Prepare the juices as follows**

**juice 1** citrus (lemon, grapefruit, orange or lime) prepared by squeezing the fruit.

**juice 2** pineapple (or mango) prepared by adding water and homogenising in a blender (a mortar and pestle could be used instead.) For each gram of fruit, add an equal volume of water, e.g. 20 g fruit and 20 cm<sup>3</sup> water. After blending, filter through muslin or other coarse material.

**juices 3 and 4** Any fruit juices of the centre's choice. These can be any of the above not already used, apple juice and anything available locally. Please record the juices used on the supervisor's form.

It may be difficult for some centres to supply the above. It is acceptable to use boxed fruit juices, even a mixture. Therefore any citrus mixture, not diluted, could be used for **juice 1**, any tropical mixture containing pineapple juice for **juice 2** and the rest can be any juices not already included. Any boxed fruit juices may be used undiluted.

However, **do not use** fruit that has been tinned or heat treated in any way.

**Candidate should have access to extra solutions without penalty.**

**For Question 2**

*Each candidate will require:*

- (i) semicircular glass or equivalent perspex block (approximately 10 cm in diameter) ;
- (ii) 4 optical pins and pin board of about A4 size ;
- (iii) sheet of plain A4 paper ;
- (iv) a protractor ;
- (v) a ruler graduated in mm ;

**On the front of the Supervisor's Results please state whether all semicircular blocks have the same dimensions or whether there were different sizes in use.**

**For Question 3**

*Each candidate will require:*

- (i) about  $10\text{ cm}^3$   $1.0\text{ mol dm}^{-3}$  hydrochloric acid,  $\text{HCl}$  labelled **A** ;
- (ii) about  $10\text{ cm}^3$   $0.1\text{ mol dm}^{-3}$  potassium nitrate,  $\text{KNO}_3$  labelled **B** ;
- (iii) about  $10\text{ cm}^3$   $1.0\text{ mol dm}^{-3}$  nitric acid,  $\text{HNO}_3$  labelled **C** ;
- (iv) access to solid anhydrous sodium carbonate,  $\text{Na}_2\text{CO}_3$  labelled **sodium carbonate** ;
- (v) access to  $0.05\text{ mol dm}^{-3}$  silver nitrate solution labelled **silver nitrate** ;
- (vi) 3 test-tubes, size 125 x 15 mm, and rack (or suitable beaker to hold tubes) ;
- (vii) spatula.

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 6.

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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)



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