

---

**COMBINED SCIENCE**

**0653/52**

Paper 5 Practical Test

**February/March 2017**

**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 Confidential Instructions, please contact Cambridge stating the Centre number, the nature of the query and the syllabus number quoted above.

email info@cie.org.uk  
phone +44 1223 553554  
fax +44 1223 553558



---

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

**READ THESE INSTRUCTIONS FIRST**

These Confidential Instructions detail the apparatus, reagents and specimens required by each candidate for each experiment in this paper.

The Supervisor is **not** allowed to consult the Question Paper before the examination. This teacher should, as part of the preparation of the examination requirements, test the apparatus in order to ensure that it is satisfactory.

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

More material may be issued if required, without penalty, but this should not be necessary. If a candidate breaks any of the apparatus the matter should be rectified and a note made in the Supervisor's Report.

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

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Only those tests described in the Question Paper should be attempted. Suitable eye protection should be provided.

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.

Attention is drawn, in particular, to certain materials used in the examination. The following codes are used where relevant.

**C** corrosive substance

**MH** moderate hazard

**HH** health hazard

**T** acutely toxic

**F** flammable

**O** oxidising

**N** hazardous to the aquatic environment

Hazard data sheets should be available from your suppliers.

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**.

The Supervisor should make sure the Supervisor's Report is fully completed and a copy is enclosed with **each** packet of scripts.

**Question 1**

Each candidate will require

- (i) 10 cm<sup>3</sup> solution **A**, labelled **solution A** (see note 1)
- (ii) 10 cm<sup>3</sup> solution **B**, labelled **solution B** (see note 2)
- (iii) 6 test-tubes (125 mm × 15 mm) and method of supporting them
- (iv) stirring rod
- [N] (v) iodine solution and dropper, labelled **iodine solution**
- (vi) Benedict's solution and dropper, labelled **Benedict's solution**
- [C] (vii) biuret solution and dropper, labelled **biuret solution**
- (viii) access to a water-bath at approximately 80 °C
- (ix) paper towels
- (x) access to clean water
- (xi) means of labelling glassware.

**Notes**

1. Solution **A** can be made the day before the examination and refrigerated and must contain equal volumes of approximately 5% starch solution and 5% glucose solution.
2. Solution **B** can be made the day before the examination and refrigerated and must contain equal volumes of approximately 5% starch solution and 1% protein suspension.

Centres may provide fewer test-tubes, the minimum being 3 test-tubes (125 mm × 15 mm). If this is the case, candidates will have to rinse test-tubes with distilled water so this must be provided.

**Question 2**

Each candidate will require

- [HH][N] (i) approximately 3 g of a mixture of ammonium chloride [HH] and copper oxide [HH][N] in equal parts by mass labelled **H**
- (ii) approximately 20 cm<sup>3</sup> 1.0 mol dm<sup>-3</sup> hydrochloric acid labelled **hydrochloric acid**
- [C] (iii) approximately 20 cm<sup>3</sup> 1.0 mol dm<sup>-3</sup> nitric acid labelled **nitric acid**
- [N] (iv) approximately 5 cm<sup>3</sup> 0.05 mol dm<sup>-3</sup> silver nitrate solution labelled **silver nitrate**
- (v) approximately 50 cm<sup>3</sup> 0.05 mol dm<sup>-3</sup> ammonia solution labelled **ammonia solution**
- [MH] (vi) approximately 20 cm<sup>3</sup> 0.4 mol dm<sup>-3</sup> sodium hydroxide solution labelled **sodium hydroxide solution**
- (vii) approximately 20 cm<sup>3</sup> distilled water labelled **distilled water**
- (viii) 10 cm<sup>3</sup> measuring cylinder
- (ix) stirring rod
- (x) 100 cm<sup>3</sup> beaker
- (xi) 3 test-tubes (125 mm × 15 mm) and means to support them
- (xii) 3 large hard-glass test-tubes (150 mm × 25 mm) and means to support them
- (xiii) filter funnel
- (xiv) filter paper
- (xv) Bunsen burner and means to light it.

Centres may provide fewer test-tubes, the minimum being 2 test-tubes (125 mm × 15 mm) and 2 large hard-glass test-tubes (150 mm × 25 mm). If this is the case, candidates will have to rinse test-tubes with distilled water which must be provided.

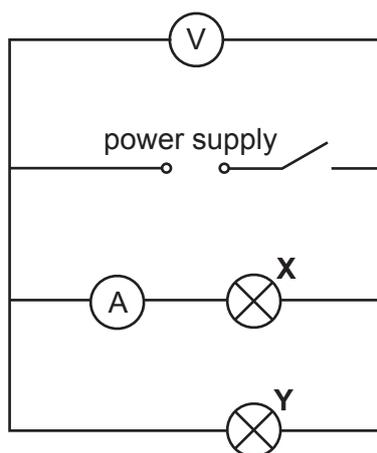
### Question 3

Each candidate will require

- (i) a d.c. power supply of approximately 1.5V to 2V. If candidates are supplied with a power supply of variable voltage output, the voltage should be set by the Supervisor and fixed e.g. taped
- (ii) 2 similar lamps – any low voltage lamps will suffice, provided that they glow when connected as shown in Fig. 3.1. The lamps must be supplied in suitable holders
- (iii) a voltmeter capable of measuring up to 2.5V with minimum resolution of 0.1 V
- (iv) an ammeter capable of measuring up to 1.00A with a minimum resolution of 0.05A
- (v) a switch. The switch may be an integral part of the power supply
- (vi) sufficient connecting leads to build the circuit shown in Fig. 3.1, plus two spare leads.

### Notes

1. The circuit shown in Fig. 3.1 below must be set up for the candidates.



**Fig. 3.1**

- 2. Label the lamps **X** and **Y**.
- 3. Spare lamps should be available.

### Action at changeover

During the course of the experiment, candidates will be asked to rearrange the circuit shown in Fig. 3.1.

Reconnect the circuit as shown in Fig. 3.1.

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 done, out of sight of the candidates, using the same solutions, reagents, specimens and apparatus as the candidates.**

**A copy of the 'Supervisor's Results' should be returned with each packet of scripts. Failure to do so may cause the candidates to be penalised.**

**BLANK PAGE**

**This form must be completed and returned in the envelope with the scripts together with the seating plan and the Supervisor's Results as mentioned on page 6.**

**February/March 2017**

*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 Supervisor)

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 ..... (Supervisor)

---

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.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cie.org.uk](http://www.cie.org.uk) after the live examination series.

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.