



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**BIOLOGY**

**0610/53**

Paper 5 Practical Test

**October/November 2013**

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

by email    [Info@cie.org.uk](mailto:Info@cie.org.uk)

by phone    +44 1223 553554

by fax       +44 1223 553558

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

\* 1 0 8 4 7 8 4 5 0 1 \*

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



**READ THESE INSTRUCTIONS FIRST**

These instructions give details of the apparatus 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 Biology teacher to test the apparatus appropriately. **Testing must be done out of sight of all candidates. No access to the question paper is permitted in advance of the examination.** Centres are reminded that candidates are expected to follow the instructions on the question paper and record all their results. They will not be penalised if these results are not what they expect.

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

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

**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

**N** = harmful to the environment

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **email** to [info@cie.org.uk](mailto:info@cie.org.uk), by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

### Question 1

Each candidate should be provided with:

- (i) safety equipment for eye protection – follow the local health / safety procedure and plastic gloves if required
- (ii) delivery tube, set up as shown in Fig. 1.1

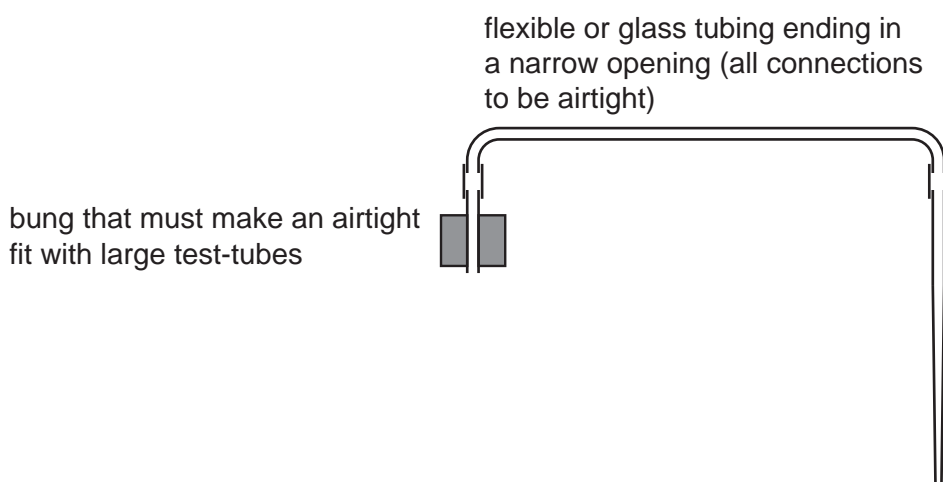


Fig. 1.1

Narrow bore capillary tubing could be used in place of the flexible / glass tubing. If this is not available, the end can be narrowed by attaching a pipette.

- (iii) large test-tube
- [H] (iv) four large test-tubes sealed with bungs, each containing 5 cm<sup>3</sup> of 2% of hydrogen peroxide solution, labelled **hydrogen peroxide**, presented in a test-tube rack or other suitable container

If the solution is prepared the day before the examination, it is important that it is stored in a dark bottle, out of sunlight.

- (v) 2g of soaked, ground up seeds of mung beans, *Vigna radiata*, presented in two similar large test-tubes, labelled **seeds 1** and **seeds 2**, in a test-tube rack or other suitable container

This can be made in bulk for all of the candidates and then 2g weighed out per test-tube. The test-tubes must be covered with plastic film to prevent drying.

The preparation of the extract needs to be carried out on the morning of the examination so that the ground-up tissue is fresh and not dried out.

- (vi) 2g of soaked, ground up seedlings of mung beans, *Vigna radiata*, presented in two similar large test-tubes, labelled **seedlings 1** and **seedlings 2**, in a test-tube rack or other suitable container

The seedlings must have been germinated for at least four days prior to being ground up. You should include shoot and root tissue but not the cotyledons. This can be made in bulk for all of the candidates and then 2g per test-tube weighed out. The test-tubes must be covered with plastic film to prevent drying.

The preparation of the extract needs to be carried out on the morning of the examination so that the ground-up tissue is fresh and not dried out.

- (vii) view of a clock or timer that allows the candidate to time a minute accurately
- (viii) paper tissues / towels
- (ix) means to support test-tubes such as test-tube rack or suitable container
- (x) ruler (mm)

The Supervisor (**not** the Invigilator) is expected to carry out the practical aspects of **Question 1** and record their results in the space provided in the Supervisor's Report. This must be done during the examination, using the same apparatus and reagents as the candidates but out of sight of the candidates.

## Question 2

Each candidate should be provided with:

- (i) 2 soaked bean seeds, presented in a dish, with the testa (seed coat) intact  
Suggested bean seeds include: broad bean, *Vicia faba*; butter or lima bean, *Phaseolus lunatus*; tepary bean, *P. acutifolius*.

The bean seeds need to be soaked for 48 hours in water and should show the level of development shown in Fig. 2.1.



**Fig. 2.1**

Remove the testa (seed coat) from a small sample of bean seeds and carefully separate the two cotyledons (halves) of the bean seeds.

If the bean seeds are underdeveloped they must be soaked for longer.

A candidate may need more than 2 seeds if there is no embryo present in their initial 2.

It is recommended that a trial is run to determine the appropriate length of soaking time in advance of the examination.

- (ii) ruler (mm)  
(iii) hand lens ( at least  $\times 6$ )  
(iv) white tile

Supervisors must provide in the Supervisor's Report the identity of the bean seeds provided, the range of lengths of the bean seeds and two images, ideally photographs (a detailed line drawing should be supplied if this is not possible). The first image should show clearly the whole bean seed. For the second image, the Supervisor should prepare and display the bean seed as described in **Question 2(b)** on the Question Paper.



This form should be completed and sent to the Examiner with the scripts.

**SUPERVISOR'S REPORT ON PRACTICAL BIOLOGY**

**IGCSE**

**October/November Session 2013**

*The Supervisor or Teacher responsible for the subject should provide the following information.*

- 1** Was any difficulty experienced in providing necessary materials? If so, give brief details.

.....

.....

.....

- 2** Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

- (a)** difficulties with specimens or materials;

.....

- (b)** accidents to apparatus or materials;

.....

- (c)** any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

.....

Other cases of individual hardship, e.g. illness or disability, should be reported direct to Cambridge on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

- 3** During the examination, the Supervisor should, **out of sight of the candidates**, carry out **Question 1**, using the same apparatus and mixtures as the candidates. Results should be recorded in the space on page **8** (**not** on a spare Question Paper). The Invigilator should **not** carry out **Question 1**.



Please record the range of the room temperature in the laboratory during the examination

.....

For **Question 2**, please identify the bean seeds and attach two photographs, as detailed on page 5. If photographs are not possible, please attach detailed line drawings.

Please record the range of lengths of bean seeds. ....

- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidates for each session must be enclosed with the scripts.

**Declaration** (to be signed by the Principal or the Examinations Officer)

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

Signed .....

Name (in block capitals) .....

Centre number .....

Centre name .....

If scripts are required to be dispatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are inside **each packet**.

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