



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

0610/51

Paper 5 Practical Test

October/November 2015

CONFIDENTIAL INSTRUCTIONS

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

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

by e-mail 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.



The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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 that 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 the 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

N = harmful to the environment

T = toxic substance

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 **e-mail** to 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) eye protection
- (ii) iodine in potassium iodide solution, as used for food testing, in the usual dispensing bottle (with dropping pipette), labelled **iodine solution**
- (iii) three glass rods
- (iv) paper towels
- (v) one small beaker of water, labelled **water**
- (vi) two white tiles (minimum size 10 cm × 10 cm)
- (vii) means of labelling tiles and test-tubes
- (viii) two large test-tubes, to be provided in a beaker or test-tube rack to support the test-tubes in an upright position
- (ix) one syringe, to measure a volume of 5 cm³
- (x) 20 cm³ of a starch and sodium chloride solution mixture, in a beaker labelled **starch solution**
- (xi) one test-tube, containing 2 cm³ of 1% amylase solution and 2 cm³ of pH5 buffer solution, labelled **A5**
- (xii) one test-tube, containing 2 cm³ of 1% amylase solution and 2 cm³ of pH7 buffer solution, labelled **A7**
- (xiii) view of a clock or timer that allows candidates to time minute intervals accurately.

Preparation Instructions*1% amylase solution*

To prepare 1% amylase solution, dissolve 1g of powdered diastase in 100 cm³ distilled or deionised water (note that diastase is recommended as other sources of amylase may not work in the context of this examination).

starch and sodium chloride solution mixture

To prepare 1% starch solution, use a soluble starch (such as potato). Mix 1g of dried starch with cold water to form a paste and then add boiling water up to a total volume of 100 cm³, stirring until the solution becomes clear. Allow the solution to cool.

To prepare 1% sodium chloride solution, dissolve 1g of sodium chloride in 100 cm³ of cold water.

Add 5 cm³ of the 1% sodium chloride solution to 100 cm³ of the 1% starch solution. This is sufficient for five candidates and can be made up to 3 days before the examination.

buffer solutions

pH5 and pH7 buffers can be purchased in tablet form, with full instructions for use. Alternatively, they can be freshly made up using 0.1 mol dm^{-3} citric acid solution and 0.2 mol dm^{-3} di-sodium hydrogen phosphate solution in the proportions shown in Table 1.

Table 1

pH	to prepare 100 cm^3 citric acid-phosphate buffer:	
	0.2 mol dm^{-3} di-sodium hydrogen phosphate/ cm^3	0.1 mol dm^{-3} citric acid/ cm^3
5	52	48
7	82	18

To prepare 0.2 mol dm^{-3} di-sodium hydrogen phosphate solution, dissolve 28.4 g of di-sodium hydrogen phosphate in 1 dm^3 of distilled or deionised water.

To prepare 0.1 mol dm^{-3} citric acid solution, dissolve 19.21 g of sodium citrate in 1 dm^3 of distilled or deionised water.

Before the examination, the Supervisor must trial part of this investigation.

It is necessary to test the digestion of the starch solution by the amylase. Prepare the contents of test-tube **A5** as described in **(xi)**. Use iodine solution to determine when the end point of the reaction has been reached for test-tube **A5**. This should take approximately eight minutes. If the digestion takes place a lot quicker, the amylase solution should be diluted and/or the sodium chloride solution should be omitted. If the digestion takes much longer than eight minutes, dilute the starch solution. In both instances, re-trial and record any final changes in the Supervisor's Report.

Question 2

Each candidate should be provided with:

- (i) one 5 cm length of ripe maize cob
- (ii) one hand lens (at least $\times 6$ magnification)
- (iii) one ruler (with mm scale)

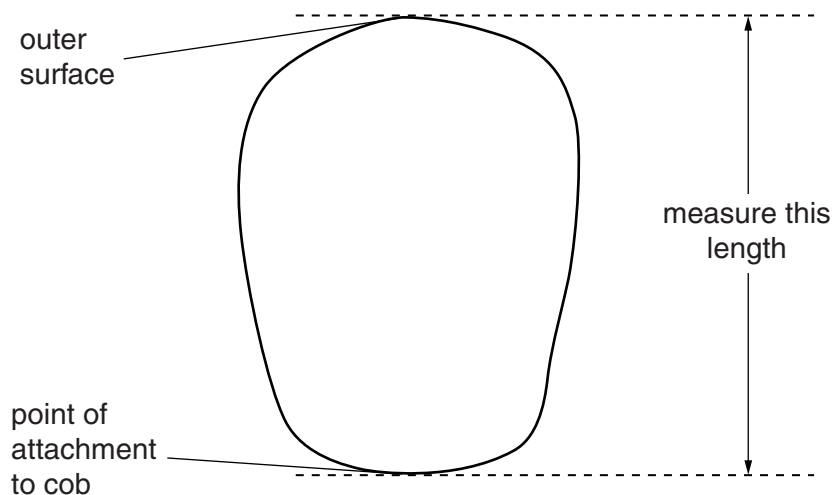


Fig. 1

Before the examination, the Supervisor should remove and measure the length of a sample of maize grains (as shown in Fig. 1) and record the range of lengths in the space provided in the Supervisor's Report.

The Supervisor (**not** the Invigilator) should 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.

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This form should be completed and returned to CIE with the scripts.

REPORT ON PRACTICAL BIOLOGY

The Supervisor should provide the following information.

- 1 Was any difficulty experienced in providing the 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) assistance provided in case of colour-blindness;

.....

(d) 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 directly to CIE 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 the practical aspects of **Question 1**, using the same apparatus and reagents 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**.

Range of lengths of typical maize grains

- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidate 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 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**.