



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

**5090/31**

Paper 3 Practical Test

**October/November 2012**

CONFIDENTIAL INSTRUCTIONS

**1 hour 15 minutes**

**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: [International@cie.org.uk](mailto:International@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.

This document consists of **6** printed pages and **2** blank pages.



**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. **No access to the question paper is permitted in advance of the examination session.**

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.

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.**

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 in the left margin where relevant.

**C** = corrosive substance

**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

**Instructions to Supervisors**

*Each candidate to be provided with:*

**Question 1**

- (i) 100 cm<sup>3</sup> apple pulp provided in a suitable container, labelled **W1**.

Use crisp and juicy cooking apples. Peel the apples and remove the core. Chop the apples into small pieces. Place approximately 100g of pieces in a blender with a small quantity of water (about 50 cm<sup>3</sup>) to help the blending process. Blend until there is a **smooth** pulp (no lumps).

The blending should be done on the day of the examination. The apple pulp should be covered and kept in a refrigerator. The discolouration of the apple pulp will not affect the experiment.

Stir the apple pulp thoroughly before putting it into the labelled containers.

- (ii) Two test-tubes in a test-tube rack containing:

- 5 cm<sup>3</sup> of water labelled '**no enzyme**'.
- 5 cm<sup>3</sup> 2% enzyme solution labelled '**2% enzyme**'.

Prepare the enzyme solution as follows:

2% enzyme solution – add 2 g of pectinase powder to 100 cm<sup>3</sup> of water.

The enzyme solution must be prepared on the day of the examination.

Pectinase is readily available from scientific suppliers. In some parts of the world, it may also be available from wine manufacturers in powder form, sold by the name of 'Pectolase'.

Pectinase is also available in liquid form. When making up the solutions, follow the instructions provided by the manufacturer. (Often it can be assumed that 1 cm<sup>3</sup> of the liquid form is equivalent to 1 g of the powder.)

It is advisable to use freshly purchased pectinase.

- (iii) 2 empty containers that can contain at least 100 cm<sup>3</sup>. Plastic cups may be suitable,
- (iv) a means of labelling containers,
- (v) a plastic spoon,
- (vi) means of washing plastic spoon,
- (vii) sight of a clock,
- (viii) 2 small measuring cylinders, 25 cm<sup>3</sup> or 50 cm<sup>3</sup> labelled **A** and **B**,
- (ix) 2 filter funnels with filter coarse paper. NB Fine filter papers should **not** be used,
- (x) Paper towels.

The following trial should be carried out as soon as these instructions are received.

- Prepare 100 cm<sup>3</sup> of apple pulp as instructed above. Measure pH and record this in the Report.
  - Prepare a 2% pectinase solution as instructed above.
  - Take 50 cm<sup>3</sup> of apple pulp, place in a beaker and add 5 cm<sup>3</sup> of water. Stir thoroughly.
  - The other 50 cm<sup>3</sup> of apple pulp, place in a second beaker and add 5 cm<sup>3</sup> of 2% pectinase solution. Stir thoroughly.
  - Leave the mixtures for 10 minutes.
  - After 10 minutes, filter each mixture into two different measuring cylinders.
  - You should notice that the mixture with the pectinase gives a larger volume of clearer juice than the mixture with water.
  - If there is no difference between the filtrates: try a different variety of apple, obtain fresh pectinase, a different filter paper, or try a higher concentration of pectinase (if a higher concentration is used in the examination it **must** be labelled 2%).
- 2
- (i) 5 cm length of a fresh cucumber, presented on a white tile [or suitable surface for slices to be cut on] to be labelled **K1**. This length must be cut only shortly before the examination and covered in cling film or other similar material to stop the surfaces drying out and hardening,
  - (ii) suitable implement to cut thin slices of **K1**,
  - (iii) hand lens,
  - (iv) shallow container such as a half petri dish containing water and labelled '**water**',
  - (v) shallow container such as a half petri dish containing salt solution and labelled '**salt solution**'. This salt solution should be prepared by dissolving 30 g salt in 100 cm<sup>3</sup> water,
  - (vi) ruler (mm).

The following trial should be carried out as soon as these instructions are received.

Cut 2 thin slices of cucumber [each 2 mm thick]. Remove the central tissue containing the seeds to leave a thin layer of soft tissue (approximately 2 mm) inside the green outer layer which should be left intact.

Cut one slice in half to make two semicircles and place one into a container of water and the other half into a container of salt solution [concentration as outlined in instructions].

Within 2 minutes a change in curvature should be observed. If this takes a longer time interval, increase the salt concentration or use a fresher cucumber.



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

**REPORT ON PRACTICAL BIOLOGY**

**General Certificate of Education Ordinary Level**

**October/November Session 2012**

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

- 1** Was any difficulty experienced in providing necessary material for Question 1?

.....

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

.....

Record pH of apple pulp .....

Record the volumes of apple juice obtained in your trial.

No enzyme ..... + 2% enzyme .....

Was any difficulty experienced in providing necessary material for Question 2?

- 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 CIE on the normal 'Special Consideration Form' as detailed in Part 6 of the Handbook for Centres.



**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.

Signed .....

Name (in block capitals) .....

Centre number .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the relevant Supervisor's report and the appropriate seating plan(s) are inside **each envelope**.

