Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/53**

Paper 5 Practical Test **May/June 2014**

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 Confidential Instructions, please contact CIE
by email 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.

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 on 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 **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) 6 test-tubes

(ii) means to label test-tubes

(iii) 1 beaker with 1 test-tube, the beaker should contain an ice and water mixture to a depth of about 5 cm, labelled **cold**
The water temperature should be no higher than 5 °C.

(iv) 1 beaker with 1 test-tube, the beaker should contain water at room temperature to a depth of about 5 cm, labelled **warm**
The water temperature should be no higher than 20 °C.

(v) 1 beaker with 1 test-tube suitable for containing water at 50 °C to a depth of about 5 cm, labelled **hot**

(vi) supply of water at 50 °C

Candidates have been instructed to raise their hand when they need the hot water.

(vii) 25 cm^3 of **full fat** cow's milk in a container labelled **milk**

(viii) 25 cm^3 of sodium carbonate solution, 0.05 mol dm^{-3}, in a container labelled **sodium carbonate solution**

(ix) 10 cm^3 of 2% lipase solution in a container labelled **lipase**

(x) 2 cm^3 of bromothymol blue indicator in a bottle labelled **bromothymol blue** with a dropping pipette

(xi) view of a clock or timer that allows the candidate to time a minute accurately

(xii) 3 5 cm^3 syringes

(xiii) 2 dropping (teat) pipettes

(xiv) thermometer (–10 °C to 110 °C, graduated in 1 °C intervals)

(xv) empty container labelled **waste** and access to water for washing

(xvi) paper towels

Solution preparation:

0.05 mol dm^{-3} sodium carbonate (Na_2CO_3):

- Dissolve 5.53 g of solid sodium carbonate in 500 cm^3 of distilled water.
- Add distilled water to make up to 1 dm^3.

[H] *0.01 mol dm^{-3} sodium hydroxide (NaOH):*

- Dissolve 0.4 g sodium hydroxide in 500 cm^3 of distilled water.
- Add distilled water to make up to 1 dm^3.

[H] *2% lipase solution:*

- Dissolve 2 g of solid lipase in 100 cm^3 of distilled water.

OR

- Add 2 cm^3 liquid concentrate to 98 cm^3 of distilled water.

The most commonly used source of lipase is porcine. There are alternative fungal and bacterial sources that can be purchased. Centres that do not wish to use porcine sources of the enzyme should investigate these alternative sources as soon as possible.

[H] *Aqueous bromothymol blue indicator:*

- Add 0.1 g solid bromothymol blue to 16 cm^3 of 0.01 mol dm^{-3} NaOH and mix thoroughly.
- Add the mixture to distilled water to a total volume of 250 cm^3.

The pH of the distilled water should be checked before making this solution.

Before the examination the Supervisor should carry out part of the investigation by mixing 2 cm^3 whole milk, 2 cm^3 sodium carbonate and 3 drops of bromothymol blue indicator. Then add 3 cm^3 of lipase solution and observe the colour. The indicator should change colour in 20 minutes at room temperature (20 °C). If a shorter time is recorded, dilute the enzyme in small increments and retest. If a longer time is recorded, increase the concentration of the enzyme in small increments and retest.

The Supervisor (**not** the invigilator) should carry out the practical aspects of Question 1 and record the results in the space in the supervisor's report. This must be done during the examination, using the same apparatus as the candidates but **out of sight** of the candidates.

Question 2

Each candidate should be provided with:

(i) 5 cm piece of an unripe banana with the skin on, placed on a white tile and covered by a paper towel
The banana should be firm and the skin partly green. Plantain must **not** be used.

(ii) means of cutting a slice from the banana, e.g. scalpel or small knife

(iii) iodine in potassium iodide solution in a bottle with a dropping pipette labelled **iodine solution**
This should be the dilute iodine in potassium iodide normally used for starch tests.

(iv) paper towels.

Before the practical examination the Supervisor (not the invigilator) should cut a slice of the banana and add iodine. The colours of the layers should be recorded in the space in the Supervisor's report.

Supervisors should also measure the diameter of a sample of the bananas used and record the size range (mm) in the space provided in the Supervisor's report.

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

SUPERVISOR'S 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.

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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;

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(b) accidents to apparatus or materials;

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(c) assistance provided in case of colour-blindness;

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

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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 the Handbook for Centres.

3 During the examination, the supervisor should, **out of sight of the candidates,** carry out the practical parts of **Question 1** and **Question 2**, using the same apparatus and reagents as the candidates. Results should be recorded in the space on page **8** (**not** on the spare Question Paper). The Invigilator should **not** carry out **Question 1** or **Question 2**.

Results for Question 1

Results for Question 2

Range of diameters of bananas .....

4 Enclose a plan of work benches with the scripts, giving details of the candidate numbers for the places occupied by the candidate for each session.

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 despatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are sent inside **each packet**.