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**BIOLOGY (PRINCIPAL)**

**9790/04**

Paper 4 Practical

**May/June 2017**

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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**The Supervisor's attention is drawn to the form on page 7 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.

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The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 3 Pre-U Certificate.

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

### Instructions for preparing apparatus

These Confidential Instructions give details of the apparatus and materials required by each candidate for this paper. Sufficient information is given to permit the Centre to set up and test the apparatus and materials so that the candidates can be fairly assessed.

**No access to the Question Paper is permitted in advance of 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.

Candidates must be provided with a microscope with:

- low-power objective lens, e.g.  $\times 10$  (equal to 16 mm or 2/3")
- high-power objective lens, e.g.  $\times 40$  (equal to 4 mm or 1/6")
- eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

Each candidate should have sole, uninterrupted use of the microscope for a period of at least 60 minutes.

### HEALTH AND SAFETY

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. Pipette fillers and suitable eye protection should be used when 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.

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

<b>C</b> corrosive	<b>MH</b> moderate hazard
<b>HH</b> health hazard	<b>T</b> acutely toxic
<b>F</b> flammable	<b>O</b> oxidising
<b>N</b> hazardous to the aquatic environment	

The attention of Supervisors is drawn to any local regulations relating to safety, first aid and disposal of chemicals.

'Hazard Data Sheets' relating to materials used in this examination should be available from your chemical supplier.

### Instructions to Supervisors

Each candidate must be provided with the following apparatus and materials.

*To be supplied by the Centre*

#### Question 1

All solutions and distilled water should be provided to candidates at room temperature.

Each candidate will require, for a period of at least 90 minutes:

- (i) 50 cm<sup>3</sup> of diluted coconut water, in a beaker labelled **10% coconut water**.

Centres must use the Vita Coco<sup>®</sup> brand of coconut water.

Dilute the coconut water by a factor of ten, e.g. by making up 10 cm<sup>3</sup> of coconut water to a total of 100 cm<sup>3</sup> with distilled water.

- (ii) 100 cm<sup>3</sup> of 100 g dm<sup>-3</sup> glucose solution, in a beaker labelled **100 g dm<sup>-3</sup> glucose solution**.
- (iii) 100 cm<sup>3</sup> of 10 g dm<sup>-3</sup> glucose solution, in a beaker labelled **10 g dm<sup>-3</sup> glucose solution**.
- (iv) 100 cm<sup>3</sup> qualitative Benedict's solution, in a beaker labelled **Benedict's solution**.
- (v) 20 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> hydrochloric acid, in a small beaker labelled **dilute hydrochloric acid**.
- [C] (vi) 20 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> sodium hydroxide solution, in a small beaker labelled **dilute sodium hydroxide**.
- (vii) Diastix<sup>®</sup> test strips. Candidates will need at least 10 strips. The test strips may be cut lengthwise into two. The strips **must** be provided in a stoppered sample (specimen) tube labelled **Diastix**. Test strips should be taken from a newly opened packet that is not out of date.
- (viii) Universal Indicator paper (full range) and colour chart.
- (ix) Glass beaker to hold up to 600 cm<sup>3</sup>, to act as a hot water-bath.
- (x) Access to a source of boiling water for setting up the water-bath. Candidates are not expected to heat water from cold.
- (xi) Bunsen burner, gauze and tripod.
- (xii) 200 cm<sup>3</sup> distilled water, in a beaker labelled **distilled water**.
- (xiii) 250 cm<sup>3</sup> distilled water, in a beaker labelled **washing water**.
- (xiv) 10 test-tubes.
- (xv) Rack or racks to hold at least 10 test-tubes.
- (xvi) Three 10 cm<sup>3</sup> syringes.
- (xvii) Two 5 cm<sup>3</sup> syringes.

- (xviii) Six small beakers to hold 50 cm<sup>3</sup> or 100 cm<sup>3</sup>.
- (xix) Thermometer (–10 °C to 110 °C).
- (xx) Stirring rod.
- (xxi) Test-tube holder.
- (xxii) White tile, approximately 10 cm × 10 cm.
- (xxiii) Specimen (sample) tube or other suitable small flat-bottomed tube.
- (xxiv) Two bungs to fit test-tubes.
- (xxv) Pasteur pipette, plastic.
- (xxvi) Marker pen.
- (xxvii) Stopwatch, stop-clock or bench timer.
- (xxviii) Beaker for waste, labelled **waste**.
- (xxix) Six paper towels.
- (xxx) Protective gloves.
- (xxxi) Suitable eye protection.

Extra supplies of glucose solutions, Benedict's solution, Diastix<sup>®</sup> test strips and test-tubes should be available if candidates request them.

## Question 2

Each candidate must have sole, uninterrupted use of a microscope fitted with an eyepiece graticule for a period of at least 60 minutes, as described on page 2.

Each candidate will require, for a period of at least 60 minutes:

- (i) Hand lens, e.g. ×10.
- (ii) Stage micrometer.
- (iii) Transparent ruler (mm).

## Question 3

No materials are required.

*To be supplied by Cambridge*

### Question 1

- (i) Colour chart to use with Diastix<sup>®</sup> test strips. To be provided to candidates as an Insert in the Question Papers.

**Do not provide candidates with any Diastix<sup>®</sup> colour charts supplied by the manufacturer.**

### Question 2

- (i) Slide **T1**. The number of slides supplied by Cambridge will be equal to half of the candidate entry.
- (ii) Slide **L1**. The number of slides supplied by Cambridge will be equal to half of the candidate entry.

### Question 3

No materials to be supplied by Cambridge.

## RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Please read the following instructions carefully.

Immediately after the examination the slides must be returned to Cambridge in the containers in which they were received, using the self-adhesive labels for the parcel. They must not be included in parcels of scripts.

Please clearly indicate your Centre number when returning slides.

Slides and containers not returned in good condition will be charged at the rate of £3 per item.

The address for the return of slides is:

Ian Couchman  
Cambridge International Examinations Laboratory  
1 Hills Road  
Cambridge  
CB1 2EU

The slides may be purchased from Cambridge, rather than being returned, using the form enclosed with the slides.

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**This form must be completed and sent to the Examiner in the envelope with the scripts.**

### **SUPERVISOR'S REPORT**

*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 arising from faulty specimens or microscopes
  - (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.

All other cases of individual hardship, e.g. illness or disability, should be reported directly to Cambridge on the normal 'Special Consideration Form'.

3. Results for Question 1. These should be obtained by the Supervisor or other competent biologist out of sight of candidates. Separate results should be provided for each session held, each laboratory used in that session and each set of materials supplied.

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

**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.

Signed .....

Name (in block capitals) .....

Centre number .....

Centre name .....

If scripts are required by Cambridge 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 sent inside **each envelope**.