**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Ordinary Level**

# MARK SCHEME for the October/November 2009 question paper

# for the guidance of teachers

# 5090 BIOLOGY

**5090/06**    Paper 6 (Alternative to Practical), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination.  It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2009 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

UNIVERSITY *of* CAMBRIDGE
International Examinations

www.dynamicpapers.com

| Page 2 | Mark Scheme: Teachers' version | Syllabus | Paper |
|---|---|---|---|
| | GCE O LEVEL – October/November 2009 | 5090 | 06 |

1  (a)  **A** = guard cell  ;
        **B** = stoma(ta)  ;                                                                                          [2]


   (b)  (i)  $CO_2$  ;                                                                                                  [1]

        (ii)  $O_2$ and water (<u>vapour</u>)  ;                                                                        [1]

        (iii)  stomata/pore/guard cell closed (in darkness)  ;                                                         [1]

        (iv)  either:   <u>cobalt chloride</u> paper on leaf  ;  how held  ;
                        (blue to) pink shows water  ;
              or:       plant in bell-jar (etc)  ;  droplets (condense)  ;
                        test for water  ;
              or:       aquatic plant  ;  bubbles  ;  test for oxygen/glowing splint  ;          [max 3]


   (c)  (i)  measurements of both with units (once)  ;

              expression  $\dfrac{49(-52)}{8(9)} \times 400$  ;

              magnification correctly given  ;  (× 2450 or c. 1100 if wrong dimension used)
              R: decimal places
              *Look for reasonable and consistent attempts.*                                                         [3]

        (ii)  thicker <u>inner</u> wall  ;
              causes bending/banana shape  ;   when cell turgid  ;                                                    [3]

        (iii)  <u>chloroplast</u>  ;
               iodine (solution)/methylene blue  ;                                                                    [2]

        (iv)  two from:
              photosynthesis in light  ;   produces CHO/sugar  ;   R:  starch/food
              in cell sap/solution affects water potential  ;   AW
              ref. osmosis/water enters/turgor  ;                                                                     [2]

                                                                                                         **[Total: 18]**


2  (a)  Table 2.1

| statement | starch test | reducing sugar test | biuret test | ethanol emulsion test |
|---|---|---|---|---|
| heating is required | ✗ | ✓ | ✗ | ✗ |
| when test solution added contents of test-tube are blue | ✗ | ✓ | ✓ | ✗ |
| the test is completed by the addition of water | ✗ | ✗ | ✗ | ✓ |
| positive result of test is contents turning black | ✓ | ✗ | ✗ | ✗ |
| the test can be carried out on a solution of the test material in water | ✓ **or** ✗ | ✓ | ✓ | ✗ |
| the material being tested is a carbohydrate | ✓ | ✓ | ✗ | ✗ |

        (1 mark per line)
        max 3 if words used          **R: any line with ✓ and ✗ and blank**                                [6]

www.dynamicpapers.com

| Page 3 | Mark Scheme: Teachers' version | Syllabus | Paper |
|---|---|---|---|
| | GCE O LEVEL – October/November 2009 | 5090 | 06 |

(b) (i) reducing sugar test ; [1]

(ii) small amount (etc) of reducing sugar ; [1]

(c) reducing sugar test:
for gentle/even heating ; avoids spurting ; test-tube breaking ;
burning finger or other safety factor ; may change substrate ; (e.g. starch to reducing sugar)
R: ref heating alcohol or decolourising leaf [2]

**[Total: 10]**

3 (a) (i) all boxes reasonably filled ; [1]

(ii) table marks:
one clear method of 'tally' (etc), somewhere ;
total 'numbers' given ;
third column grouping correct and total 25 ; [3]

(iii) frequency diagram marks:
3–5 ruled, uniform columns, good size ;
axes labelled, with units ;
range of each column clear on x-axis ;
accurate for numbers in table ;
reversed axes: allow 1, 3 and 4    line graph allow 2 and 4 [4]

(b) (seedlings from) seeds of different sizes ;
grown in uniform conditions ;
two specified (soil/medium, light, nutrients, temperature, water) ;
seeds (collected and) measured ;
range recorded/tabulated ;
thus variation within single genotype ;
extent of range – same for shorter and longer parents?
replications ;
analysis/conclusion suggested ;
allow approach of: same size seeds ;
grown in different conditions ; and so on for other points above [max 4]

**[Total: 12]**