CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0653 COMBINED SCIENCE

0653/51 Paper 5 (Practical Test), maximum raw mark 30

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

1 **(a)** *first row:* 10, 10, 10, 10 ;
   second row: 0, 5 – 10, 0, 5 – 10 ;

(b) light not necessary ;
   water is necessary ;   [2]

(c) tube **R1** colour recorded as red / orange / yellow / green ;
   tube **S1** colour recorded as no change / blue (not blue-green) ;
   tube **R2** colour recorded as orange / brown / yellow ;
   tube **S2** colour recorded as blue / black ;   [4]

(d) *starch* – seeds (not just **S2**) ;
   reducing sugar – radicles / roots (not just **R1**) ;
   (must have correct observations in the table)   [2]

                                                                               [Total: 10]

2 **(a)** **(i)** entry for *d* for 50 g (must be < 60) ;   [1]

   (ii) / (iii)
      entries for *d* (60, 70, 80 g) ;
      d values decrease for increasing *m* ;   [2]

(b) **(i)** two 1 / m values:
      0.017 / 0.0167   (not 0.016)
      0.014 / 0.0143   (not 0.0142) ;   [1]

   (ii) vertical axis linearly numbered **AND** labelled ;
      3 points plotted correctly within ½ square ;
      best straight line ;
      *(no graph marks for plotting wrong column from table but allow gradient to be
      calculated from a straight line)*   [3]

   (iii) working shown either in space **or** on graph as coordinates, triangle **or** Δ*x* and
      Δ*y* **AND** change in *d* must be at least 10 (or 4 cm of paper vertically) ;
      gradient value from a correct working method ;
      (no gradient marks from a graph with a curve or point to point lines)   [2]

   (iv) value using mass of rule = 300 – (gradient from **(b) (iii)** / 10) ;   [1]

                                                                               [Total: 10]

3 **(a)** **(i)** first value entered in column 2 of table and < 10 ;

(ii) two more readings in column 2 ;
all readings to 1 decimal point ;
2 of the readings within $0.4\,cm^3$; [3]

(iii) column 3 completed (10 – column 2) ; [1]

(iv) average calculation for V_{av} [1]

(v) correct values used (V_{av} = **(a)(iv)**, c_a = 0.013 and V_a= 10) ;
correct rearranging, $c_s = 2 \times c_a \times V_a / V_{av}$;
correct c_s calculated value to 2 (or more) significant figures ;
(correct value only scores all three marks)
(calculation mark may be awarded following wrong substitution and / or
wrong rearrangement providing all terms included) [3]

(b) colour = red / orange **AND** pH = 1 – 4 ; [1]

[Total: 10]