UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0653 COMBINED SCIENCE
0654 CO-ORDINATED SCIENCES

0653/06 and 0654/06   Paper 6 (Alternative to Practical), maximum raw mark 60

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1   (a) (i)   table containing three rows and at least 2 columns (without a row for headings)
OR 2 rows and 3 columns (1)
additional row showing headings entered correctly; shape, vertical height
(with or without mention of units of length in heading) (1)

    (ii)   **A** tall (long) OR straight, **B** short OR straight; **C** curved (bent) OWTTE   [3]

(iii) & (iv)   measurements of **vertical** heights should be checked on photographs. Measured
as cm or mm and should be accurate to ± 2 mm. Seedlings must be marked on
photographs or no marks can be given
max 2 marks if no units given
max 2 marks if measured from base of seedling, not base of photograph
max 2 marks if measurements written elsewhere than in the table
(do not accept "slant height" of seedling **C**)   [3]

   (b)   box **C**, light causes plant to bend/phototropism OWTTE   [1]

[Total: 9]

2   (a) (i)   readings: 15.0s, 17.0s (no tolerance)
if 1st decimal place is missing, maximum 1 mark   [2]

    (ii) $15/20 = 0.75$, $17/20 = 0.85$ (one or both correct) e.c.f.
(answers must show 2 d.p.)   [1]

    (iii) $0.75^2 = 0.56$, $0.85^2 = 0.72$ (e.c.f.) (one or both correct)
(at least one answer must show 2 d.p.)   [1]

   (b)   3 or 4 points correctly plotted; vertical tolerance +/– 0.01 (half small square) (e.c.f.)
horizontal; no tolerance (1)
straight line drawn, not passing through the origin (1)   [2]

   (c)   **any** x- and y- distances marked or triangle drawn on the graph
from which gradient may be calculated (1)
gradient calculated as y/x (e.c.f.)
example:
$$\frac{0.90 - 0.42}{(500 - 200)} = \frac{0.47}{300}$$ (working must be shown) $= 1.56 \times 10^{-3}$ (accept 1 d.p.) (1)   [2]

   (d) $\dfrac{75 \times 0.0002}{1.56 \times 10^{-3}} = 9.57$ (accept 1 d.p.) (e.c.f.) working need not be shown   [1]

   (e)   The spring and weight hanger has a mass/
the spring will oscillate even if no weights are added OWTTE   [1]

[Total: 10]

3 (a) (i) aqueous (dissolved in water)

    (ii) solid

(b) less than $50\,cm^3$ [1]

(c) two folds at right angles OWTTE (1)
    open out (to form a cone) OWTTE (1)
    Accept answers shown as diagrams (no mark if filter paper is cut)   [2]

(d) pour (distilled) water through the precipitate (to wash it) OWTTE   [1]

(e) add a few drops of potassium carbonate to see if there is a precipitate (1)
    EITHER if there is, not enough has been added OWTTE
    OR if there is no precipitate, enough has been added (1)   [2]

(f) (partly) evaporate the solution (by heating) (1)
    leave to crystallise (without heating) OWTTE (1)
    (one mark only for "evaporate to dryness")   [2]

                                                           [Total: 10]

4 (a) (i) ruler **C** 22.5 cm   ruler **D** 20.9 cm (no tolerance)   [2]

    (ii) average **C**   22.1 cm
        average **D**   21.3 cm   (e.c.f.)   [2]

    (iii) reaction time   **B** = 0.27 sec;   **C** = 0.21 sec;   **D** = 0.21 sec; (e.c.f.)   [3]

(b) impulse sent via motor neurone/efferent nerve
    (no mark for "nerve" alone)   [1]

(c) person **B** (1)
    reaction time is greater (1)
    more likely to have an accident (due to slow reaction) OWTTE (1)   [3]
    <u>If the question has not been understood, the answer and mark allocation</u>
    <u>may be as follows, for a maximum of 2 marks:</u>
    person **C** or **D** (no mark)
    reaction time is smaller (faster) (e.c.f.) (1)
    less likely to have an accident OWTTE (1)

                                                           [Total: 11]

5   (a) (i)   12 mm, 67 mm, 64 mm (+/– 1 mm)
                (if recorded as centimetres e.g. 1.2, 6.7, 6.4 deduct 1 mark)

        (ii)   so that they all have the same temperature (rise) OWTTE
               REJECT; to make it a fair test/ so that conditions are equal   [1]

        (iii) so that all the water is at the same temperature/
               all tubes are equally heated OWTTE   [1]

     (b) the result will be too large (1)
          because the air expands more than the liquid (1)   [2]

     (c) (i)   less than (1)
                because the glass particles have stronger forces between them /
                otherwise level of liquid would drop/reference to results (1)   [2]

        (ii)   attraction within water is greater than in ethanol OR attraction in ethanol
               is less than in water OWTTE   [1]

                                                                                    [Total: 10]

6   (a) (i)   observation; white (1)
                conclusion: sulfate/SO_4^{2-} (1)   [2]

        (ii)   observation: magnesium dissolves/bubbling/effervescence/
               fizzing/colourless solution formed
               (reject "gas is given off") (1)
               observation: hydrogen burns, "pop" OWTTE (1)   [2]

        (iii) observations: 1: flame extinguished/goes out/dies (1)
                               2: cloudy/milky/chalky/white precipitate (1)   [2]

     (b) (i)   observation: brown (precipitate)   [1]

        (ii)   test: silver nitrate/$AgNO_3$ (1)
               observation: white (precipitate) (1)   [2]

     (c) observation: green/greeny-blue   [1]

                                                                                    [Total: 10]