UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0653 COMBINED SCIENCE

0653/61 Paper 61 (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, which would have considered the acceptability of alternative answers.

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1 **(a)** **(i)** test **B** column: 1, 7, 1, 1 ;
test **C** column: 2, 8, 0, 0 ;

(ii) average column: 1.6, 7.0, 1.0, 0.3 ;;
(3 or 4 correct, 2 marks, 2 correct, 1 mark) [2]

(b) vertical axis correctly labelled ;
horizontal axis shows label for each bar ;
all bars at correct height ; [3]

(c) **(i)** damp and dark ; [1]

(ii) EITHER
dark ;
woodlice hide from predators ;
OR
damp ;
prevents desiccation (of woodlice) ;
(allow damp and dark as the condition) [max 2]

[Total: 10]

2 **(a)** **(i)** current / electron flow changes direction **or** polarity changes / OWTTE ; [1]

(ii) current causes a (changing) magnetic field ;
alternately attracts and repels permanent magnet OWTTE ; [2]

(b) **(i)** 9.4 cm, 12.4 cm, 15.6 ± 1 mm ;;; [3]

(ii) 0.094, 0.124, 0.156 (e.c.f.) ; [1]

(iii) (data from Fig. 2.2 used to show that) successive distances in the same time interval are greater OWTTE [1]

(c) e.g. $\mathbf{g} = \frac{2 \times 0.0156}{(0.18)^2}$;
= 9.63 ; [2]
(1 mark only if no calculation is shown but value of **g** is between 8.6 and 10.0)

[Total: 10]

3 **(a)** red, orange (in this order) ; [1]

(b) **(i)** **X** ; [1]

(ii) it took more alkali (to neutralise the acid) ; [1]

(c) to wash out the pipette and / or beaker (OWTTE) ;

(d) lithium, sodium, potassium or ammonium hydroxide (ammonia solution) ; [
(reject calcium hydroxide)

(e) **(i)** silver chloride / AgCl ; [1]

(ii) hydrochloric acid / HCl ; [1]

(f) reference to: equal amounts (lengths) of magnesium ribbon ;
same reaction temperature ;
same volume of acid ;
measure amount of hydrogen given off in given time / rate of bubbling **or**
measure time taken to dissolve magnesium ;
(any three points including the last one) ; [max 3]

[Total: 10]

4 **(a)** **(i)** light is refracted (bent) at curved surface / beaker (and water) act as a lens / OWTTE ; [1]

(ii) 18.5 – 12 ;
= 6.5 cm (65 mm) (correctly recorded) ;
(± 1 mm)
(allow correct answer for 2 marks even if no calculation shown) [2]

(iii) 17.3 – 12 = 5.3 cm (53 mm) ; [1]
(± 1 mm) (award mark either for equation or for result)

(b) at least 2 points correctly plotted (e.c.f.) ;
straight line drawn passing through (0,0) ; [2]

(c) graph shows clearly the vertical and horizontal distances ;
calculation to give result (e.c.f. depends on candidate's graph but should be 1.2 ± 0.1) ; [2]

(d) measure known volume of liquid into (weighed) beaker and weigh to find mass of liquid ;
divide mass by volume ; [2]

[Total: 10]

5 **(a)** **(i)** sun leaf 59 mm ;
shade leaf 72 mm ;
(allow 1 mm tolerance) [2]

(ii) greater capture of sunlight (for photosynthesis) ; [1]

(b) table with three columns and two rows all correctly headed (or vice versa) ;
correct comparison of leaf thickness ;
correct comparison of numbers of palisade cells (or 2 layers/1 layer) ;
correct comparison of size of air spaces ;

(c) any suitable feature and linked explanation. e.g.
feature two rows of palisade cells ;
explanation greater amount of photosynthesis ; [2]

(d) prevents too much water (vapour) loss due to transpiration / evaporation ; [1]

[Total: 10]

6 **(a)** a named carbonate (allow marble, limestone) ;
a named acid ; [2]
(for 'a carbonate and an acid' give 1 mark only)

(b) CO_2 + C (both correct) ; [1]

(c) 1. the bulb lights up ;
2. there is a reading on the ammeter (1 and 2 in any order) ; [2]
(no mark for 'a reading on the voltmeter') ;

(d) **(i)** 42.3 (no tolerance) ; [1]

(ii) 43.9 – 35.9 = 8.0 (accept '8') [1]

(iii) 43.9 – 42.3 = 1.6 ; [1]

(iv) reduction ; [1]

(e) carbon monoxide is poisonous / harmful / dangerous ; [1]

[Total: 10]