UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0652 PHYSICAL SCIENCE

0652/61 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, which would have considered the acceptability of alternative answers.

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1 (a) **Q** ;

(b) ammeter, cell and battery in series ;
voltmeter in parallel with cell ;
polarities correct ; [3]

(c) **A** = 0.55 (A) ;
B = 0.3(0) (V) ; [2]

(d) (i) movement of (named) ions ; (ignore electrons) [1]

(ii) more (greater concentration) of ions present ; (reject: greater concentration of copper chloride soln.) [1]

(e) (i) *cathode*: red / brown / pink solid deposit ; [1]

(ii) *anode* ; bubbles / effervescence / fizzing ; [1]

[Total: 10]

2 (a) (i) 37 s ; 52 s ; 19 s ; (no tolerance) [3]

(ii) **C**
A
B (correct order) ; [1]

(b) (i) filter funnel showing filter paper and vessel to collect filtrate ; (labels not required) [1]

(ii) copper hydroxide ; [1]

(iii) copper oxide ; [1]

(c) more bubbles from magnesium than from zinc ;
no bubbles from metal **X** ; [2]

(d) the carbonate of the more reactive metal does not decompose as easily / owtte ; [1]

[Total: 10]

3 **(a)** **(i)** 45 60 75
11.3 ; 11.2 ; 11.7 ; (1 mark for each pair)

(ii) all values correct (line 2 divided by 10) ; (allow 1 error) (allow e.c.f. from **3(a)(i)**) [1]

(iii) 1.14 ; (e.c.f.) [1]

(b) (no), all results are within experimental error / close together / no correlation / trend / pattern ;
OR
(yes), because all results are not the same ; [max 1]

(c) repeat (each part of the experiment several times) and find the average ; [1]

(d) 0.3 ; [1]

(e) $g = \frac{39.5 \times 0.3}{1.14^2}$; (e.c.f.)
$= 9.1\ (m/s^2)$; [2]

[Total: 10]

4 **(a)** **(i)** 17 ;

(ii) 5780 (m) ; [1]

(b) **(i)** 4 ; [1]

(ii) 0.5 (s) ; [1]

(iii) 4/0.5 = 8 (Hz) ; [1]

(iv) 340/8 = 42.5 (m) ; [1]

(c) **(i)** greater number of waves than line 1 of Fig. 4.4 ; [1]

(ii) greater amplitude than line 1 of Fig. 4.4 ;
same number of waves as line 1 of Fig. 4.4 ; [2]

(d) transverse ; [1]

[Total: 10]

5 **(a)** **(i)** water enters the gas-jar ;

(ii) air pressure pushes the water from the bowl into the gas-jar / air pressure greater outside (the jar) ;
OR
water enters to take the place of the dissolved gas ; [max 1]

(b) add named indicator ;
result for acid: colour to match indicator ;
result for alkali: colour to match indicator ; [3]

(c) place glowing / lit splint into gas ;
result: splint bursts into flame / relights / burns brighter ; [2]

(d) place burning splint into gas ;
result: gas burns accept 'pop' ; [2]

(e) ammonia and sulfur dioxide (any order) ; [1]

[Total: 10]

6 **(a)** 12.1 cm ;
10.1 cm ; (both ± 1 mm) [2]

(b) **(i)** **A** and **V** in correct places ; (e.c.f. if reversed) [1]

(ii) 4.5 V ; 0.3 A ; (no tolerance) [2]

(iii) R = V/I ;
R = 4.5 / 0.3 = 15 (ohms) ; (e.c.f.) [2]

(c) **(i)** column 1 shows the data for wire **X** ;
column 2 shows data for wire **Y** ; [1]

(ii) the thinner the wire, the greater the resistance / owtte ;
the longer the wire, the greater the resistance / owtte ;
(allow cross-sectional area for thickness of wire) [2]

[Total: 10]