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

0653 COMBINED SCIENCE

0653/61 Paper 6 (Alternative to Practical), maximum raw mark 60

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1 (a) (i) 57 ; 63 ; 53 ; (no tolerance) [3]

(ii) oxygen ; [1]

(iii) 57.7 ; [1]

(iv) boiled gives no reaction and raw gives more bubbles / faster reaction ;
(boiling) denatures enzyme / catalase ; [2]

(b) (i) not heated fully through / long enough / not all enzyme denatured / some enzyme still present ; [1]

(ii) surface area of liver ;
temperature ;
pH ;
detergent ;
concentration of hydrogen peroxide solution ; [max 2]

[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) [3]

(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) $g = \frac{3.95 \times 0.3}{1.14^2}$; (e.c.f.)
$= 9.1\,(m/s^2)$; [2]

[Total: 10]

4 **(a)** brown ;
blue / black ; [2]

(b) **(i)** 135 ; 105 ; (no tolerance) [2]

(ii) plotting correct (allow e.c.f.) ;
curve drawn ; [2]

(iii) pH 6 – 7; [1]

(c) **(i)** use pH values between 6 and 7 / owtte ;
take samples more frequently ; [2]

(ii) would find activity / more information about intermediate values ;
OR
may find endpoint at a time between 15 s intervals ; [max 1]

[Total: 10]

5 **(a)** **(i)** water enters the gas-jar ; [1]

(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 ; (no mark 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]