Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/63**

Paper 6 Alternative to Practical **May/June 2016**

MARK SCHEME

Maximum Mark: 60

Published

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1 **(a)** incisor (front) ;
molar (back) ; [2]

(b) **(i)** dissolve sample of plaque in distilled water ;
use of full range indicator / pH meter ; [2]

(ii) below 7 ; [1]

(iii) acid produced by bacteria / sugar forms acid ; [1]

(c) 2 groups – brushing twice and brushing three times ;
over several days / weeks ;
compare / measure amount of staining ;
less staining means less plaque ;
swap groups over as a control ; [max 4]

[Total: 10]

2 **(a)** **(i)** salt **C** label pointing to residue in filter paper
AND
salt **B** label pointing to filtrate in beaker ; [1]

(ii) correct residue label
AND
correct filtrate label ; [1]

(b) **(i)**

	conclusion
(add HCl)	not carbonate / not CO_3^{2-} ;
(add HCl + BaCl)	sulfate / SO_4^{2-} ;
(add NaOH)	copper(II) / Cu^{2+} ;

[3]

(ii) copper(II) sulfate ; [1]

(c) **(i)** limewater goes milky / white ppt. ; [1]

(ii) white ppt. ;
ppt. dissolves ; [2]

(iii) $ZnCO_3$; [1]

[Total: 10]

3 **(a)** 0.19 (V) ; [1]

(b) *R* values correct (should be: 0.79, 2.42, 4.00) ;
consistent significant figures ; [2]

(c) axes labelled with units ;
suitable choice of scales ($\geqslant \frac{1}{2}$ the grid used) ;
plots correct to $\frac{1}{2}$ small square ;
good best-fit line judgement ; [4]

(d) directly proportional ;
straight line through the origin ; [2]

(e) switch off between readings / fan the wire / resistor in series with the wire ; [max 1]

[Total: 10]

4 **(a)** good size drawing with clear lines ;
correct shape ; [2]

(b) **(i)** correct measurement (34 mm) ; [1]

(ii) correct measurement (from their drawing) ; [1]

(iii) correct calculation ; [1]

(c) **(i)** 3 correct labels ;;; [3]

(ii) (agree)
cell wall and nucleus = 1 mark ;
any ***one*** *from:* starch grain / vacuole / chloroplast ; [max 2]

[Total: 10]

5 **(a)** **(i)** 71.8 ;
79.6 ; [2]

(ii) 20.3 ;
28.1 ; [2]

(iii) 48 ; [1]

(iv) not all iron reacted / not hot enough ; etc. [1]

(b) chlorine / gas is toxic ; [1]

(c) use of sodium hydroxide ;
mention of dissolving, water, solution or aqueous ;
iron(II) green ppt. **AND** iron(III) brown ppt.; [3]

[Total: 10]

6 **(a)** **(i)** 118 ; [1]

(ii) 83 (only) ; [1]

(iii) max use of paper e.g. vertical axis starts at 30 ;
correct plotting ;
smooth curves ;
(at least) one curve labelled ; [4]

(iv) *(similar)* both start at same temp / both go down, etc. ;
(different) go down at different rates / end at different temps, etc. ; [2]

(b) result at <u>8 mins</u> is wrong / anomalous ; [1]

(c) e.g. pour same volume of water into each container ;
or record initial temperatures in the beakers ; [max 1]

[Total: 10]