



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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[Turn over

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	63

- 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]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	63

- 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 ($\geq \frac{1}{2}$ 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]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	63

- (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 8 mins 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]