

MARK SCHEME for the May/June 2014 series

0654 CO-ORDINATED SCIENCES

0654/51

Paper 5 (Practical), maximum raw mark 45

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
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- 1 (a) result recorded for each vitamin C solution ;
 result recorded for the fruit juice ;
trend: number of drops needed **increases** as concentration decreases (2 marks) ;;
(allow 1 mark if trend correct with two adjacent readings the same) [4]
- (b) vertical axis labelled correctly and scales for both axes are linear and increasing ;
 all four points plotted correctly ± 0.5 square ;
 suitable straight line for the four points (not including a fruit juice point) ; [3]
- (c) line from number of drops of unknown fruit juice shown on graph/fruit juice point plotted and distinct from other points ;
 correct vitamin C content reading from graph (allow ecf from a curve) ; [2]
- (d) a control/to see if water alone has an effect/owtte ; [1]
- (e) drop sizes vary ;
 use a syringe/burette ;
OR
 difficult to judge end point/not properly mixed ;
 stir after each drop ;
OR
 only 2 drops DCPIP used ;
 use more drops DCPIP in larger wells ;
(to award second mark the improvement must match a stated inaccuracy) [max 2]
- (f) carry out the experiment more than once ;
 calculate a mean/identify an anomalous result ; [2]
- (g) scurvy/poor wound healing/loosening or loss of teeth/bleeding gums ; [1]

[Total: 15]

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- 2 (a) milky / white ppt in limewater ;
solid remains white / solid remains the same ; [2]
- (b) (i) (green) to blue-green / blue / dark green ; [1]
(ii) bubbles / effervescence / fizzes ; [1]
(iii) no reaction / no ppt / nothing happens ; [1]
(iv) blue-green solid / cloudy blue / cloudy green / blue ppt / green ppt ; [1]
- (c) (i) (green) to purple / (dark) blue ; [1]
(ii) bubbles / effervescence / fizzes ; [1]
(iii) no reaction / no ppt / nothing happens ; [1]
(iv) (pale) blue ppt ; [1]
- (d) (i) *test 1: Universal Indicator / (i) AND test 2: copper sulfate / (iv) ;*
(OR tests reversed) [1]
(ii) *observation for test 1: purple / blue (not green) ;*
observation for test 2: (pale) blue ppt ; (ecf from (c) (iv) blue solid / cloudy
blue) [2]
(OR tests reversed)
(iii) sodium carbonate / Na_2CO_3 ;
carbon dioxide / CO_2 ; [2]

[Total: 15]

Page 4	Mark Scheme	Syllabus	Paper
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- 3 (a) (i) m_1 recorded to nearest 0.1 g ; [1]
- (ii) V_1 recorded and between 40 and 60 (ignore decimal places) ; [1]
- (iii) $V_2 > V_1$ (ignore decimal places) ; [1]
- (iv) correct subtraction for V_3 ($V_2 - V_1$) but must include any decimal places from above ; [1]
- (v) density value correct and minimum two significant figures and between one and three ; [1]
- (b) (i) l, b, h values present ;
to nearest 0.1 cm ; [2]
- (ii) V_4 correct and minimum two significant figures ; [1]
- (iii) x present and to nearest 0.1 cm ;
 $x < 40.0$ cm ; [2]
- (iv) correct calculation and minimum two significant figures ; [1]
- (v) d evaluated ;
correct d to two or three significant figures ; [2]
- (c) difficulty in moulding a perfect cube/rounded corners/not regular shape ;
volume of thread adds to the total volume ;
difficulty in measuring x /recording an accurate balance point ;
water still remaining on plasticine ; [max 2]

[Total: 15]