



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/62

Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 40

Published

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.

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This document consists of 7 printed pages.

Question	Answer	Marks
1(a)(i)	8.5 ;	1
1(a)(ii)	1.5 ;	1
1(a)(iii)	2.0 ;	1
1(b)	average calculated ; outlier excluded (ave = 0.5) ;	2
1(c)	A has more vitamin C / A is more concentrated (than B) ora ;	1
1(d)(i)	correct calculation (0.0025 or 0.003) ; answer to appropriate significant figures (1 or 2) ;	2
1(d)(ii)	burette / syringe / graduated pipette ;	1
1(e)	enlarged circle (greater than 5 cm diameter) ; continuous line around outside and 9–11 segments ; pith and centre shown ;	3
1(f)	biuret ;	1

Question	Answer	Marks
2(a)(i)	test tube and bung and delivery tube above solid and 1 label ; delivery tube into container without bung, under the level of the limewater (with label on limewater) ;	2
2(a)(ii)	carbon dioxide / CO ₂ ;	1
2(a)(iii)	carbonate ;	1
2(b)	copper (ion) / Cu ²⁺ ;	1
2(c)	F (copper) oxide ; G (copper) sulfate ;	2

Question	Answer	Marks
3	<i>one mark from each section and then any other 3 marks from:</i> 1. apparatus flask / test-tube / boiling-tube and heating apparatus, e.g. Bunsen burner ; (gas) syringe / measuring cylinder to collect gas / burette / weighing scale ; measuring cylinder to measure fizzy drink ; 2. method and safety drink in a container with delivery tube into gas syringe or upturned container in water ; heat / leave (until no more gas is given off) / shake (until no more gas is given off) ; wear goggles when heating / wear goggles to prevent (hot) fizzy drink from going into eyes / take precaution against hot apparatus, e.g. tongs, wait for apparatus to cool before touching, use heat gloves to protect against burning ; repeat for same type of fizzy drink ; 3. measurements and control same amount of drink used / quotes volume of drink used / measures volume or mass of drink used ; measure <u>volume</u> of CO₂ evolved / measure <u>mass</u> lost ; to constant volume of gas / to constant mass ; 4. processing and use of results calculate average amount of CO₂ evolved for each type of drink (if measurements repeated) ; compare volume/mass of CO₂ / largest volume collected has most CO₂ / smallest volume collected has least CO₂ / largest loss in mass has most CO₂ / smallest loss in mass has least CO₂ ;	7

Question	Answer	Marks
4(a)(i)	5(.0) (cm) ;	1
4(a)(ii)	50. <u>0</u> (cm) ;	1
4(b)(i)	14.18 ; 14.16 ;	2
4(b)(ii)	14.17 ;	1
4(b)(iii)	correct calculation of T and T^2 (1.417 and 2.01) ;	1
4(c)(i)	(time for complete swing is when bob crosses ...) retort stand upright / line drawn on card / any sensible description that shows attempt to time from a point in swing to same point in swing ;	1
4(c)(ii)	reaction time of humans / human error in timing / one oscillation is too short to time accurately / difficult to start/stop at exactly the right time ; reduced percentage uncertainty / uncertainty spread over more oscillations / uncertainty less significant over more oscillations ;	2
4(d)(i)	axes right way round with linear scale so that plots occupy at least half of grid, starting from 0 ; correct plots to $\pm \frac{1}{2}$ small square ;	2
4(d)(ii)	appropriate best-fit <u>straight</u> line based on plots ;	1
4(e)	T^2 is (directly) proportional to L ;	1