Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/61**

Paper 6 Alternative to Practical **May/June 2019**

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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Question	Answer	Marks
1(a)(i)	fills more than 50% of space ; Continuous, smooth line around outside of apple shape and two pips in the core ;	**2**
1(a)(ii)	photograph 54–58 (mm) ;	**1**
1(a)(iii)	correct calculation for magnification (drawing over photograph) ;	**1**
1(b)	Benedicts ; heat (with Benedicts) ; (independent) orange / (brick) red / yellow / green ;	**3**

Question	Answer	Marks
2	**1 apparatus** lamp / sunlight / light source ; apparatus for collecting gas ; stop-clock / timer ; **2 method and variables** change brightness of light / change distance (from lamp) ; same amount of time (at each brightness) ; repeat experiment at each brightness ; control length elodea / control volume of water ; control temperature / carbon dioxide / pH ; stated safety precaution linked to apparatus ; **3 measurements** measure distance / intensity of light ; measure volume of gas / count bubbles ; **4 processing results and make conclusion** **calculate rate** as volume / number of bubbles per unit time ; idea of looking for relationship between rate / volume / number of bubbles and intensity / brightness / distance ; graph of rate / volume / number of bubbles against intensity / brightness / distance ;	**7**

Question	Answer	Marks
3(a)	33.5 ; 55.0 ;	**2**
3(b)(i)	linear scale more than half grid ; at least 6 points correctly plotted ± ½ a small square ;	**2**
3(b)(ii)	2 straight lines drawn with ruler, through all points and meet in a cross ;	**1**
3(b)(iii)	maximum T from their graph ;	**1**
3(c)	same as **(b)(iii)** ;	**1**
3(d)(i)	43.5 ;	**1**
3(d)(ii)	lines labelled magnesium and zinc ; 2 straight lines drawn with ruler, through all points and meet in a cross and temperature ;	**2**
3(e)	magnesium is more reactive (than zinc) ;	**1**
3(f)(i)	burette / pipette ;	**1**
3(f)(ii)	*any 1 from* lid AND reduces heat loss ; insulate cup AND reduce heat loss ;	**max 1**

Question	Answer	Marks
4(a)(i)	78.0 (cm^3) ;	**1**
4(a)(ii)	read perpendicular to the scale ;	**1**
4(a)(iii)	86.69 (g) ;	**1**
4(a)(iv)	1.11(1) g / cm^3 ; 2 or 3 sig. figs and must be correctly rounded ;	**2**
4(b)(i)	15.83 (g) ;	**1**
4(b)(ii)	24 / 23.7 / 23.66 ;	**1**
4(b)(iii)	0.67 g / cm^3 ;	**1**
4(b)(iv)	5.6 cm ;	**1**
4(b)(v)	1.4 g / cm^3 ;	**1**
4(c)	(expect no) answer values too far apart OWTTE	**1**
4(d)(i)	test-tube is curved at the bottom	**1**
4(d)(ii)	*mark as a pair* volume too high **and** density too low ;	**1**