Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/63**

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.

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Question	Answer	Marks
1(a)(i)	arrow(s) down / into **and** up / out of limewater or test-tube **B** ;	**1**
1(a)(ii)	milky / cloudy / white precipitate ;	**1**
1(a)(iii)	hydrogencarbonate ;	**1**
1(a)(iv)	sterilise mouth piece / avoid sucking up limewater / don't inhale/breathe in / breathe into the tube gently ;	**1**
1(b)(i)	relights glowing splint ;	**1**
1(b)(ii)	20–15 / = 5 ; ÷ 20 × 100 = 25(%) ;	**2**

Question	Answer	Marks
2(a)	measure pulse per unit time / description of taking pulse / heart rate monitor / smart watch or named brand ;	**1**
2(b)	At least one from each: **apparatus** stop watch ; **method and variables** method of exercise ; fixed timed intervals to measure heart rate after exercise ; repeats (the same procedure) (to find an average) ; (controlled variable) same person / control intensity of exercise e.g. same duration / same distance to run ; safety, eg running shoes so don't slip / awareness of asthma or injury ; **measurements and processing and use of results** pulse rate taken (at rest) before (and after exercise) ; pulse rate taken in 10s and multiplied by 6 / AW ; measure time between <u>end of exercise</u> and to return to normal pulse rate ; graph of time v pulse rate – read off when back to resting ;	**6**

Question	Answer	Marks
3(a)(i)	beaker / container of water ; delivery tube leads gas to upturned measuring cylinder in water with labels ;	**2**
3(a)(ii)	use a (gas) syringe ;	**1**
3(a)(iii)	86.5 ; 93.0 ;	**2**
3(b)(i)	axes labelled with units ; linear scale more than half grid ; at least 4 points plotted correctly to within half a small square ;	**3**
3(b)(ii)	continuous curve through points ;	**1**
3(c)	finishes / stops / no more CO_2 made / CO_2 stays the same **and** one or both reagents have run out ;	**1**
3(d)	line steeper (to the left) ; line continues or ends higher ;	**2**
3(e)	calcium sulfate coats the marble chips / stop acid reaching marble chips ;	**1**

Question	Answer	Marks
4(a)(i)	rubber ;	**1**
4(a)(ii)	rubber ;	**1**
4(a)(iii)	lead copper aluminium ;	**1**
4(a)(iv)	as density increases speed of sound decreases / the higher the density the slower the sound / ORA ;	**1**
4(b)(i)	58.91 – 42.65 / idea of subtracting mass of empty measuring cylinder ; 16.26 (g) ;	**2**
4(b)(ii)	make sure that the measuring cylinder is dry before measuring its mass / measure the mass (of the cylinder) before putting the water in ;	**1**
4(b)(iii)	16.5 ;	**1**
4(b)(iv)	0.985 / 0.99 (g / cm^3) ;;	**2**
4(b)(v)	(**(b)(iv)** ÷1000=) 0.000985 (kg / cm^3)	**1**
4(b)(vi)	(**(b)(v)** × 1000 000=) 985 (kg / m^3)	**1**
4(c)	yes (they are within limits of experimental accuracy) because values are close together OWTTE	**1**