



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE**0653/63**

Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 60

Published

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Question	Answer	Marks
1(a)(i)	20.5 ; 26.0 ;	2
1(a)(ii)	increases as temperature increases ; increase in temperature increases rate of reaction/photosynthesis ;	2
1(a)(iii)	amount of pondweed ; more weed produces more bubbles AW ORA ;	2
1(b)	no/fewer bubbles and light needed for photosynthesis ;	1
1(c)(i)	glowing splint and relights ;	1
1(c)(ii)	bubbles not the same size / volume / bubbles missed in counting ;	1
1(c)(iii)	measuring cylinder / burette or gas syringe and water in correct place ;	1

Question	Answer	Marks
2(a)(i)	conical flask connected using a bung to... ; ...gas syringe / inverted measuring cylinder over water ; at least two correct apparatus labels ;	3
2(a)(ii)	no more bubbles / no more gas collected / volume reading remains the same / no solid left / no zinc left ;	1
2(b)(i)	scales linear and using at least half of grid ; at least 5 points plotted correctly $\pm \frac{1}{2}$ square (excluding (0,0) ;	2
2(b)(ii)	best-fit line ;	1
2(b)(iii)	volume at $t = 5$ mins read from graph $\pm \frac{1}{2}$ square AND lines on graph ;	1
2(c)	steeper line (and through origin) ; plateau at 96 cm^3 ;	2

Question	Answer	Marks
3(a)(i)	0.18 A ; 1.4 V ;	2
3(a)(ii)	0.25(2) (W) ;	1
3(a)(iii)	cell / battery will run down ;	1
3(b)(i)	0.32 ; 0.29 ;	2
3(b)(ii)	0.61(6) (W) ;	1
3(c)	Lamps glow dimmer in series / brighter in parallel ;	1
3(d)	(lamp Y) because for same p.d.; current is smaller ; OR use V/I ; correct calculation shown ;	2

Question	Answer	Marks
4(a)	deep breath / breathe in as much as possible ; breathe out all breath AND measure new volume ;	2
4(b)(i)	(sample B) contains more carbon dioxide ; produced in respiration ; OR contains less oxygen ; used in respiration ;	2
4(b)(ii)	(bubble through) limewater and turns milky ;	1
4(c)	values higher for rate ; volume;	2
4(d)	find pulse over stated time ; before and after exercise ; repeat and average / sample size and average ;	3

Question	Answer	Marks
5(a)	correct <i>inert electrodes</i> label line ; correct <i>aqueous copper chloride</i> label line ;	2
5(b)(i)	blue litmus / red litmus ; goes white / bleached ;	2
5(b)(ii)	(pale) blue ppt. ; dark blue solution ;	2
5(c)(i)	15:00 ;	1
5(c)(ii)	12.14 ;	1
5(c)(iii)	(total) mass is proportional to (total) time ; every 300 s mass increases by 0.17 g (or equivalent argument) ;	2

Question	Answer	Marks
6(a)	voltmeter connected in parallel with heating coil ;	1
6(b)(i)	to ensure that all the water is at the same temperature ;	1
6(b)(ii)	heat still flowing from heater to the water ;	1
6(c)	18 000 (J) ;	1
6(d)	substitution / manipulation ; 5.45(4545) (J/g°C) ;	2
6(e)(i)	heat loss ; taking temperature too soon (as told temperature continues to rise) ; no repeats ;	2
6(e)(ii)	insulate the sides / base / use a lid / stir for longer/ until temperature stops rising ;	1
6(f)	(rate of)heat loss (from sides / base / surface) is equal to (rate of) heat gain (from heater) ;	1