

Cambridge IGCSE™

COMBINED SCIENCE**0653/61**

Paper 6 Alternative to Practical

May/June 2024

MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **8** printed pages.

Question	Answer	Marks
1(a)(i)	51 <u>0</u> (°C) ;	1
1(a)(ii)	syringe ;	1
1(a)(iii)	A results recorded as A0–A2 blue-black, A3–A5 brown ; C results recorded as C0–C4 blue-black, C5 brown ;	2
1(a)(iv)	blue-black means starch present and brown means starch is not present / brown is the negative result (for starch) OR idea that starch is present at the start and <u>no</u> starch is present at the end OR starch present in A0 , A1 and A2 but <u>no</u> starch in A3–A5 ; starch is broken down (by amylase) ;	2
1(a)(v)	reduces the activity of amylase / reduces the rate / slows down the reaction ;	1
1(a)(vi)	A = 4 (cm ³) C = 5 (cm ³) difference calculated as 1 (cm ³) ;	1
1(a)(vii)	add 1 cm ³ water to tube A ;	1
1(a)(viii)	so that all solutions are at <u>same</u> temperature / at <u>same</u> temperature as the water bath ;	1
1(b)(i)	58 (mm) ;	1
1(b)(ii)	58 ÷ 920 or 0.063 ; answer to one sf / 0.06 (mm) ;	2

Question	Answer	Marks
2(a)	21 ; 97 ;	2
2(b)(i)	vertical axis labelled (reaction) time in s and horizontal axis labelled with number of spatulas (of sodium hydrogencarbonate) ; linear scales so that plotted points occupy at least half the grid ; plots correct to $\pm \frac{1}{2}$ small square ;	3
2(b)(ii)	line of best fit ;	1
2(b)(iii)	as number of spatulas increases the reaction time increases ;	1
2(b)(iv)	straight line extrapolation to 6 spatulas shown on graph ; reaction time read from correct extrapolation to nearest half a square ;	2
2(c)(i)	cannot easily tell when it stops fizzing ;	1
2(c)(ii)	can identify / check for / exclude, anomalous results ;	1
2(c)(iii)	measure the mass (of the sodium hydrogencarbonate) ;	1
2(d)	(test) (bubble through) limewater and (observation) turns milky ;	1

Question	Answer	Marks
3(a)(i)	$h = 2.5 \text{ (cm)}$ and $w = 3.2 \text{ (cm)}$ and $l = 4.\underline{0} \text{ (cm)} ;$	1
3(a)(ii)	$32(.0) \text{ (cm}^3\text{)} ;$	1
3(b)(i)	$V_1 97.0 \text{ (cm}^3\text{)} ;$ $V_2 73.5 \text{ (cm}^3\text{)} ;$	2
3(b)(ii)	$23.5 \text{ (g)} ;$	1
3(c)	correct calculation of $\rho / 0.73 \text{ (g / cm}^3\text{)} ;$	1
3(d)	(effect) ρ is greater AND (reason) $(V_1 - V_2)$ is greater / M is greater ;	1

Question	Answer	Marks
4	One mark from each section and any two other marking points: (If one section is missing max 6 etc.) 1 Apparatus thermometer ; voltmeter ; 2 Method method of varying temperature of water, e.g. mix hot and cold water / using ice cubes to <u>cool</u> the water / allow hot water to cool to <u>different</u> temperatures ; use at least five different temperatures ; ensure thermistor is not touching beaker / stir to make sure temperature is evenly distributed ; 3 Measurements measure temperature of water and the current / I and measure / check / use, fixed value of voltage / V ; 4 Table of results columns for temperature / T, (voltage / V) and current / I ; with units for temperature (°C) and current (amps / A) ; 5 Processing results calculate resistance <u>from voltage and current</u> / use $R = V / I$; plot graph of resistance against temperature ; idea of repeating at the same temperature and averaging results / repeating at the same temperature to, identify / check for / exclude anomalous results ;	7