



Cambridge IGCSE™

COMBINED SCIENCE**0653/62**

Paper 6 Alternative to Practical

February/March 2022**MARK SCHEME**Maximum Mark: 40

Published

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

Question	Answer	Marks
1(a)(i)	15 ;	1
1(a)(ii)	one value correct ; 9, 15 and 27 ;	2
1(a)(iii)	3, 5 and 9 ;	1
1(b)(i)	axes correct orientation, labelled with quantity and unit ; sensible linear scales with plotted points covering at least half of the grid ; plots correct $\pm \frac{1}{2}$ small square ;	3
1(b)(ii)	suitable line of best-fit drawn ;	1
1(b)(iii)	rate of reaction increases as (total surface) area increases ;	1
1(b)(iv)	correct interpolation from graph $\pm$ half a small square ;	1
1(b)(v)	surface area used/measured (instead of number of pieces) / longer time period / (cut) from same potato ;	1
1(b)(vi)	collect in gas syringe / collect over water in measuring cylinder ;	1
1(b)(vii)	glowing splint AND relights ;	1

Question	Answer	Marks
2(a)(i)	any number higher than 7 and less than 10 ;	1
2(a)(ii)	idea that one colour may have more than one pH / the colour can only give a range of pH / can only quote pH to an integer ;	1
2(b)(i)	ammonia ;	1
2(b)(ii)	ammonium (ion) ;	1
2(b)(iii)	<i>any one from:</i> point test-tube away from other students in case liquid spits out which could harm eyes or skin ; hold test-tube with holder so hands do not get burnt ; wear goggles and protect eye from ammonia/gas or wear goggles as ammonia is harmful ;	1
2(c)(i)	bubbles / fizzes / effervesces ;	1
2(c)(ii)	carbonate ;	1

Question	Answer	Marks
3	one marking point from each section and any two others (one section missing max 6 marks etc.) apparatus gas syringe / displacement of water with a measuring cylinder used for collecting gas/CO_2 ; balance ; Bunsen burner / spirit burner ; brief description and safety precautions heat magnesium carbonate and collect/measure gas ; idea of waiting for complete reaction / waiting for the volume of gas/CO_2 to stop increasing / to end of reaction ; repeat experiment for same mass/amount of magnesium carbonate ; safety goggles to keep magnesium carbonate powder out of eyes ; measurements <u>masses</u>/amounts of magnesium carbonate ; <u>volume</u> of gas/CO_2 made (at end of reaction) ; idea of using at least five different masses ; table of results headings mass and volume ; units g and cm^3 ; processing take averages from repeated experiments (to recognise anomalies) ; plot graph of volume against mass ; idea of conclusion from graph or results e.g. straight line through the origin indicates proportional / look for trend in volume of CO_2 as mass of MgCO_3 increases or decreases ;	7

Question	Answer	Marks
4(a)(i)	$h = 6.4$ (cm) ;	1
4(a)(ii)	$l = 16.1$ (cm) ;	1
4(a)(iii)	$H = 64$ (cm) ; $L = 161$ (cm) ;	1
4(b)	0.39 (N) ; answer given to 2 sig. figs. ;	2
4(c)	0.63 (J) ;	1
4(d)(i)	stop-watch / data logger ;	1
4(d)(ii)	trial 3 / 5.40 AND value significantly bigger / different from all other values / all other values are close together ;	1
4(d)(iii)	started timing early / stopped timing too late / didn't reset stop-watch from previous trial ;	1
4(d)(iv)	2.70 ;;	2
4(e)	longer ramp / shallower slope ; reaction time is a smaller % of the total time ; OR video / record / tape / film; no reaction time / on screen timing ; OR data logger (connected to computer/timer); reduced / no reaction time ;	2