



Cambridge IGCSE™

COMBINED SCIENCE

0653/63

Paper 6 Alternative to Practical

May/June 2023

MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **9** printed pages.

Question	Answer	Marks
1(a)	size – more than half available vertical space ; quality – continuous smooth outer line with no shading ; detail – layer at top ;	3
1(b)(i)	39 (mm) ;	1
1(b)(ii)	40 circled (for mushroom 2 at 20 °C) ;	1
1(b)(iii)	39.2 ; answer to 2 sf ;	2
1(b)(iv)	no data for 30 °C / AW ;	1
1(b)(v)	<i>error:</i> (cap) not circular / diameter varies / cap top is curved (so can't lay ruler flat) ; <i>improvement:</i> take multiple measurements and find average / use tape or string to measure across curve ;	2
1(b)(vi)	more temperatures / same type of mushroom / use more mushrooms / name controlled growing conditions, e.g. light, moisture, same pH ;	1
1(c)	add water ; add universal indicator (paper) ; OR add universal indicator <u>solution</u> ; compare to a colour chart ;	2

Question	Answer	Marks
2(a)(i)	soak a splint into the solution and hold in a <u>blue</u> flame / spray solution into a <u>blue</u> flame / evaporate solution to form crystals and hold in a <u>blue</u> flame ;	1
2(a)(ii)	copper(II) (ticked) ;	1
2(b)(i)	4.18 ; 3.60 ;	2
2(b)(ii)	0.82 AND 1.40 ;	1
2(b)(iii)	y-axis labelled mass lost (during heating) in g AND x-axis labelled time (of heating) in minutes / min ; suitable linear scales so that points occupy at least half of the grid ; plots correct $\pm \frac{1}{2}$ small square ;	3
2(b)(iv)	plotted point 4 minutes and 1.52 g lost ;	1
2(b)(v)	best-fit curve drawn ignoring anomalous point ;	1
2(b)(vi)	as time (of heating) increases the mass (lost) increases ; then (the mass) stays constant ;	2
2(b)(vii)	blue flame, is hotter / reaches a higher temperature / yellow flame causes, black / carbon / soot to form on tube / reaction needs a high temperature to occur ;	1

Question	Answer	Marks
3(a)(i)	Fig. 3.1 = 51.0 AND Fig 3.2 = 52.1 (cm) ;	1
3(a)(ii)	11 (mm) ;	1
3(b)(i)	1.6 (s) ;	1
3(b)(ii)	period / time, increases when, load / weight / N increases ;	1
3(c)	(incorrect because....) when load doubles period does not double ; comparison of period values when load doubles (e.g. 3.0 – 6.0, 4.0 – 8.0) / processes values to support their answer, e.g. at 3.0N period is 1.6 but at 6.0N period is less than double / is not 3.2 / at 4.0N period is 1.8 but at 8.0N period is less than double / is not 3.6 ;	2
3(d)	measure time for 5 or more oscillations and calculate an average (for each load) ;	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 Additional apparatus: metre ruler / tape measure ; 2 Method and measurements: change height h ; use five or more values for height h ; measure d ; 3 Control variables: same car ; same ramp / same surface material of, ramp / floor ; same position of release (of the toy car on the ramp) / length of ramp ; same type of release ; 4 Table: Column headings for h and d ; units for each ; 5 Process results for conclusion: plot graph of d vs h (to look for trend) ; take an average of repeated measurements at same h ;	7