

Cambridge IGCSE™

COMBINED SCIENCE**0653/62**

Paper 6 Alternative to Practical

February/March 2025**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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Question	Answer	Marks
1(a)(i)	all five lengths correct ; all five widths correct ;	2
1(a)(ii)	correct average length calculated ;	1
1(a)(iii)	(in Fig. 1.1) the stalk is not part of the leaf / all the stalks are a different length ;	1
1(a)(iv)	difficult to judge where leaf stalk, starts / ends / difficult to judge maximum width / difficult to judge where widest point of leaf is / (edge of) leaf uneven / serrated ;	1
1(a)(v)	mp1 y-axis labelled width / mm AND x-axis labelled length / mm ; mp2 suitable linear scales so that points occupy more than half the grid ; mp3 plots correct $\pm \frac{1}{2}$ small square ;	3
1(a)(vi)	straight line of best fit drawn ;	1
1(a)(vii)	as width increases, length increases ; ora	1
1(b)	size – greater than half of available space ; quality – continuous outline ; detail – at least three serrations, central midrib and at least three veins touching midrib ;	3

Question	Answer	Marks															
2(a)	row or column showing correct mixture ; correct observations entered ; e.g. <table><tr><th>test / solutions / reactants / reagents / mixture</th><th>observation</th></tr><tr><td>H mixed with / and L</td><td>white precipitate</td></tr><tr><td>J mixed with / and K</td><td>effervescence</td></tr></table>	test / solutions / reactants / reagents / mixture	observation	H mixed with / and L	white precipitate	J mixed with / and K	effervescence	2									
test / solutions / reactants / reagents / mixture	observation																
H mixed with / and L	white precipitate																
J mixed with / and K	effervescence																
2(b)	<table><tr><th>aqueous solution</th><th>colour observed</th><th>pH of solution</th></tr><tr><td>H</td><td>(green-blue)</td><td>8</td></tr><tr><td>J</td><td>(blue)</td><td>9</td></tr><tr><td>K</td><td>red</td><td>(1)</td></tr><tr><td>L</td><td>green</td><td>(7)</td></tr></table> ;; correct pH values = 1 mark correct colours = 1 mark	aqueous solution	colour observed	pH of solution	H	(green-blue)	8	J	(blue)	9	K	red	(1)	L	green	(7)	2
aqueous solution	colour observed	pH of solution															
H	(green-blue)	8															
J	(blue)	9															
K	red	(1)															
L	green	(7)															
2(c)	H is coloured / blue colour / blue is there before adding UI / it is blue at the start / colour of H masks the colour of universal indicator ;	1															
2(d)	K ;	1															
2(e)	J AND bubbles or effervescence (with K / acid) ;	1															

Question	Answer	Marks
3	<i>one from each section and then any other two marks:</i> 1 Apparatus thermometer (to measure temperature of water) ; use of water bath or Bunsen burner to heat water / timer to measure time of shaking ; 2 Method main method: add detergent to water, shake and measure amount of foam for at least two temperatures ; 3 Measurements volume of foam ; (initial) temperature of water ; do at least five different temperatures ; 4 Control variables <u>volume</u> of water ; volume / number, of drops / mass / number of spatulas of detergent ; time of shaking / method of shaking ; 5 Processing results and conclusions calculate volume of foam from (final volume – initial volume) ; plot a graph of volume or height of foam against temperature ; use of repeated measurements (at the same temperature) to identify or exclude anomalies ;	7

Question	Answer	Marks
4(a)(i)	$h = 1.4 \text{ (cm)}$ $w = 2.9 \text{ (cm)}$; both recorded to the nearest 0.1 cm ;	2
4(a)(ii)	ruler has smallest division of 0.1 cm / does not have 0.01 divisions ;	1
4(a)(iii)	$(1.4 \times 2.9 \Rightarrow) 4.1 \text{ (cm}^2\text{)}$;	1
4(b)	22.72 (g) ;	1
4(c)(i)	$22.72 \times 9.8 / 1000 = 0.222656$; to 2 sig. figs. = 0.22 (N) ;	2
4(c)(ii)	force meter ;	1
4(d)	$(0.22 \div 4.1 \Rightarrow) 0.054$; correct unit, e.g. N / cm ² ;	2
4(e)	(pressure / P of Y is) smaller and A / area / surface area is larger (F is the same) ; ora	1
4(f)(i)	236(.0) ;	1
4(f)(ii)	the block is floating / does not sink / is not all submerged / not enough water is displaced ;	1