CAMBRIDGE
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Cambridge IGCSE™

COMBINED SCIENCE **0653/62**

Paper 6 Alternative to Practical **May/June 2024**

MARK SCHEME

Maximum Mark: 40

Published

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

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 [Turn over

Question	Answer	Marks
1(a)(i)	all results recorded in mm ; all results correct (expect 0, 5, 12, 20, 44) ± 1 mm ;	**2**
1(a)(ii)	*any **one** from:* height of liquid varies ; peas displace hydrogen peroxide ; only want to measure bubbles ;	**1**
1(a)(iii)	vertical axis labelled height or *h* in mm **AND** horizontal axis labelled number of peas ; linear scales so that plotted points occupy at least half the grid ; plots correct to ± ½ small square ;	**3**
1(a)(iv)	line of best fit ;	**1**
1(a)(v)	correct estimate from graph ; horizontal and vertical lines shown on graph ;	**2**
1(a)(vi)	as the (number of) peas increases, the height (of bubbles) increases ;	**1**
1(a)(vii)	the higher the concentration of catalase, the higher the rate of breakdown of hydrogen peroxide ;	**1**
1(b)	difficult to determine exact height / bubbles not level ;	**1**
1(c)	can identify / check for / exclude, anomalous results ;	**1**

Question	Answer	Marks
2(a)(i)	mixture of colours seen (blue-green and yellow) / (green-blue) colour only appears for a short time ;	**1**
2(a)(ii)	yellow colour will mask the flame colour / yellow flame is not as hot as the blue flame ;	**1**
2(b)	allows the precipitate to sink to the bottom of the test-tube / filters the mixture (to see colour of residue) ;	**1**
2(c)	chloride ; test **3** / (dilute) nitric acid and (aqueous) silver nitrate ;	**2**
2(d)	(light) blue precipitate ; (with excess) dark blue solution ;	**2**

Question	Answer	Marks
3	*One mark from each section and any **two** other marking points:* *(If one section is missing max 6 etc.)* **1 Apparatus** balance **AND** measuring cylinder ; stop-clock ; **2 Method** description of making different concentrations of salt solution ; leave different concentrations of salt solution to evaporate for a fixed time (**not** to dryness / crystallisation) ; at least five different concentrations of salt solution ; **3 Measurements** states values of mass of salt added to make solutions (if they use increments, must include the starting mass) / states volumes used in serial dilution ; measure mass / volume of salt solution at start and at end ; measure time (for fixed change in, mass / volume) ; **4 Control variables** temperature of liquid or room ; (initial) volume of salt solution ; **5 Processing results** calculate rate / divide mass by time ; plot a graph of change of mass against concentration of salt solution / graph of time for fixed change in mass against concentration of salt solution / graph of rate against concentration ; idea of repeat measurements at each concentration **and** averaging results / repeat measurements at each concentration to, identify / check for / exclude anomalous results ;	**7**

Question	Answer	Marks
4(a)(i)	78.5 ; 76.0 ;	**2**
4(a)(ii)	77.0 (indicated) ;	**1**
4(b)(i)	($\Delta\theta_A$) 15.0 **and** ($\Delta\theta_B$) 9.0 ;	**1**
4(b)(ii)	R_A = 0.08(333 …) **and** R_B = 0.05(0) ; both recorded to 2 sf (0.083 and 0.050) ; unit = °C / s ;	**3**
4(b)(iii)	*statement must be consistent with candidate results* **expect** rates are different (no mark) evidence of 10% calculation ; because they differ by more than 10% / are not within experimental accuracy ; **OR** rates are the same (no mark) evidence of 10% calculation ; because they are within 10% of each other / are within experimental accuracy ;	**2**
4(c)(i)	read (with eye) perpendicular (to the reading) ;	**1**
4(c)(ii)	measuring cylinder ;	**1**
4(c)(iii)	*any **two** from:* same starting temperature of water (in both beakers) ; stir the water before each temperature reading ;	**2**