

Cambridge IGCSE™

COMBINED SCIENCE**0653/61**

Paper 6 Alternative to Practical

May/June 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)	<table border="1"> <thead> <tr> <th>drink</th><th>colour with iodine solution</th><th>colour with biuret solution</th></tr> </thead> <tbody> <tr> <td>A</td><td>brown</td><td>lilac</td></tr> <tr> <td>B</td><td>blue-black</td><td>lilac</td></tr> <tr> <td>C</td><td>brown</td><td>blue</td></tr> </tbody> </table> <i>brown × 2 = 1 mark</i> <i>blue-black = 1 mark</i> <i>all of colour with biuret lilac, lilac, blue = 1 mark</i>	drink	colour with iodine solution	colour with biuret solution	A	brown	lilac	B	blue-black	lilac	C	brown	blue	3
drink	colour with iodine solution	colour with biuret solution												
A	brown	lilac												
B	blue-black	lilac												
C	brown	blue												
1(b)	A contains no starch but does contain protein ; B contains starch and protein ; C does not contain starch or protein ;	3												
1(c)	ethanol ;	1												

Question	Answer	Marks
2	One marking point from each section and any <i>two</i> others (if one section is missing max 6 etc.): 1. Apparatus (thermostatically controlled) water-bath ; stop-watch ; thermometer / measuring cylinder ; 2. Method allow both invertase and sucrose to reach (required) temperature before mixing ; mix together invertase and sucrose for at least two temperatures and use Benedict's solution ; start stop-watch when invertase and sucrose are mixed ; take samples at intervals (for testing) ; repeat at five or more different temperatures all below 100 °C ; 3. Measurements measure volume of, invertase / sucrose / provides stated value with units (cm³) ; measure time to colour change / time to (brick-)red ; measure temperature/provides stated value with units (°C) ; 4. Constant variables constant volume / amount of, invertase (solution) / control the volume / amount of, invertase / repeat with stated volume ; constant volume / amount of, sucrose (solution) / control the volume / amount of, sucrose repeat with stated volume ; 5. Processing results plot a graph of time (to colour change) against temperature ; <i>idea</i> of shorter time equals greater activity (of enzyme / invertase) ;	7

Question	Answer	Marks
3(a)(i)	43 ; 112 ;	2
3(a)(ii)	as volume (of H) decreases the (reaction) time increases ;	1
3(a)(iii)	0.70 ; 0.27 ;	2
3(a)(iv)	as volume (of H) increases the rate (of reaction) increases ;	1
3(a)(v)	measuring cylinder ;	1
3(a)(vi)	ensure <u>all</u> of magnesium is in contact with H ;	1
3(a)(vii)	to remove, (leftover) H / reaction mixture / so that there is no extra H / reaction mixture, in next experiment / to avoid changing concentration of H in next experiment ;	1
3(b)(i)	chloride / Cl^- ;	1
3(b)(ii)	acid ; (because acid) fizzes with carbonate / red with universal indicator ;	2
3(b)(iii)	carbon dioxide ;	1

Question	Answer	Marks
4(a)(i)	1.5 (cm) ;	1
4(a)(ii)	15.0 (cm) ;	1
4(b)(i)	reading 1 and reading 2 are, too far apart / too different ;	1
4(b)(ii)	12.8 and 12.4 (either order) ;	1
4(b)(iii)	12.6 ;	1

Question	Answer	Marks
4(b)(iv)	T 1.26 and T^2 1.59 ;	1
4(b)(v)	correct calculation of 10%, e.g. difference is $(10.3 - 9.9) \div 10.3 \times 100 = 3.88$ or 3.9 or 4% or $(10.3 - 9.9) \div 9.9 \times 100 = 4.04$ or 4% ; (correct calculation plus statement that) yes / this is within 10% / they are equal ;	2
4(c)(i)	horizontal axis (distance) labelled X in cm and linear scale so that plotted points occupy at least half the grid ; correct plots to $\pm \frac{1}{2}$ small square ;	2
4(c)(ii)	thin straight line of best fit drawn with even distribution of points ;	1
4(c)(iii)	extrapolation to determine intercept and correct read-off to $\pm \frac{1}{2}$ small square ;	1
4(d)	bob drawn with its centre at the same level as the top of the bench and string connected ;	1