



Cambridge IGCSE™

COMBINED SCIENCE

0653/62

Paper 6 Alternative to Practical

May/June 2021

MARK SCHEME

Maximum Mark: 40

Published

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This document consists of 7 printed pages.

Question	Answer	Marks
1(a)(i)	(B) 205 ; (C) 44 ;	2
1(a)(ii)	more glucose, greater rate of respiration / less time taken ;	1
1(a)(iii)	to spot anomalous results / to spot outliers ;	1
1(a)(iv)	type of yeast / volume of yeast / temperature / (total) volume of solution / volume of methylene blue ;	1
1(a)(v)	Benedict's AND blue ;	1
1(b)	limewater AND milky ;	1
1(c)(i)	48 (mm) ;	1
1(c)(ii)	0.0096 (mm) ;	1
1(c)(iii)	M1 clear and continuous outline of yeast cell ; M2 drawing size is half or more of the box ; M3 cell wall shown with two concentric 'circles' ; M4 large vacuole shown off centre ;	4

Question	Answer	Marks
2(a)(i)	(temperature of water) 20.5 (°C) ; (temperature of solution) 16.0 (°C) ;	2
2(a)(ii)	it is endothermic because the temperature decreases ;	1
2(b)(i)	any value greater than 1 and less than 4 ;	1
2(b)(ii)	some colours have a range of pH values / difficult to distinguish between colours / only gives pH to a whole number ;	1
2(c)(i)	(damp red litmus paper) goes blue ;	1
2(c)(ii)	ammonium ;	1

Question	Answer	Marks
3	One marking point from each section and any <u>two</u> others (e.g. if one section missed max 6 etc.): 1 apparatus balance (to measure mass of sodium hydrogencarbonate) ; measuring cylinder (to measure volume of nitric acid) ; stopwatch / timer ; 2 brief description and safety precautions idea of adding sodium hydrogencarbonate to acid of different concentrations ; add different amounts of acid and water (to vary concentration) ; repeat experiment at each concentration ; do at least five different concentrations ; wearing safety goggles to protect eyes because acid is corrosive / wear goggles to avoid powder getting into the eyes ; 3 measurements time (in seconds) (from when powder added) to when fizzing / bubbles stop ; volume / cm³, of acid / water ; 4 variables constant same amount / mass / g, of sodium hydrogencarbonate ; total volume of acid (and water) ; same temperature ; 5 processing calculate average times from repeated experiments ; plot graph of reaction time against concentration / look at pattern in reaction time as concentration increases / shorter time means a faster rate ORA ;	7

Question	Answer	Marks
4(a)(i)	1.45 (V) ; 0.82 (A) ;	2
4(a)(ii)	prevent the wire heating (which could affect resistance) ;	1
4(b)	1.8 (Ω) ; to 1 decimal place ;	2
4(c)(i)	axes correct way round and labelled with units ; suitable linear scale chosen ; all points correctly plotted ;	3
4(c)(ii)	good best-fit line judgement ;	1
4(c)(iii)	reading of R correct from candidate's graph $\pm \frac{1}{2}$ small square ;	1
4(c)(iv)	indication on graph of points chosen extending over at least half line length ; correct gradient calculation ;	2
4(d)	correct calculation of A (mm^2) ;	1