



Cambridge IGCSE™

COMBINED SCIENCE

0653/63

Paper 6 Alternative to Practical

May/June 2021

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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This document consists of 7 printed pages.

Question	Answer	Marks
1(a)(i)	°C AND s ;	1
1(a)(ii)	56 recorded for 20 °C ; 167 recorded for 50 °C ;	2
1(b)(i)	time decreases (as temperature increases to 30 / 40 °C) ; then stays the same then increases / correct reference to temperature, e.g. stays the same between 30 and 40 °C ;	2
1(b)(ii)	32 (s) ; the temperature is between 30 and 40 °C ;	2
1(c)	(indicator is red because) amino acids produced ; (amino acids) reduce pH / make it more acidic ;	2
1(d)	(so they) are thoroughly mixed ;	1
1(e)	<i>any one from:</i> volume / concentration / type, of protein solution ; volume of pepsin ; concentration of pepsin ; volume of Universal Indicator ;	1
1(f)	biuret ; lilac / purple / mauve / violet ;	2

Question	Answer	Marks
2(a)(i)	gas syringe ;	1
2(a)(ii)	(at 25 °C) 36 (cm ³) ; (at 35 °C) 41 (cm ³) ;	2
2(a)(iii)	idea that gas escapes before the bung is placed in the conical flask ;	1
2(a)(iv)	limewater AND turns milky ;	1

Question	Answer	Marks
2(b)(i)	8 / 9 ;	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

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 thermometer ; balance / measuring cylinder / syringe (to measure acid) ; insulated vessel / beaker with lid / polystyrene cup ; 2 brief description and safety precautions idea of adding different amount of sodium hydrogencarbonate to acid ; repeat experiment at each mass used ; do at least five different masses of sodium hydrogencarbonate ; safety goggles to protect eyes because acid is corrosive / goggles to avoid powder or acid getting into eyes ; 3 measurements temperature before and after / temperature change / temperature decrease ; suggests masses of sodium hydrogencarbonate up to 20 g ; 4 variables constant same volume / amount / cm³, of acid ; same concentration of acid ; 5 processing calculate averages from repeated experiments ; plot graph of temperature decrease (y) against mass (x) / look at pattern in temperature as mass increases / greater temperature decrease means more endothermic ;	7

Question	Answer	Marks
4(a)	32.0 ;	1
4(b)(i)	suitable linear scale chosen ; all points correctly plotted ;	2
4(b)(ii)	good best-fit curve judgement ;	1
4(b)(iii)	temperature judged on candidate's curve ;	1
4(c)(i)	24.5 (°C) ;	1
4(c)(ii)	10300 (J) ; 3 sig. figs. ;	2
4(d)(i)	(I =) 2.1 (A) ; (V =) 5.0 (V) ;	2
4(d)(ii)	18900 (J) ;	1
4(e)	54.5 (%) ;	1
4(f)	insulate beaker / use a plastic beaker / use of a lid ;	1