



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE**0653/61**

Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 60

Published

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Question	Answer	Marks
1(a)(i)	axes labelled with units ; at least 6 points plotted correctly $\pm$ half small square ;	2
1(a)(ii)	smooth curve ;	1
1(b)(i)	correct reading from graph and shown on graph $\pm$ half small square ;	1
1(b)(ii)	decreases ;	1
1(c)	gloves because enzyme present / goggles to protect eyes from splashes ;	1
1(d)	any four from: same volume / concentration of peroxide / solution ; same volume of bean puree / same batch of puree ; same time / same height ; minimum of 5 different temperatures ; sensible range of temperatures ; graph of volume against time for each temperature / volume in fixed time against temperature ;	4

Question	Answer	Marks
2(a)(i)	H AND white ppt. (with silver nitrate) / H AND (white) ppt dissolves in ammonia ;	1
2(a)(ii)	yes AND different coloured ppts. ;	1
2(a)(iii)	no need to eliminate carbonate / cannot be a carbonate / already know solutions are halides ;	1
2(b)(i)	J and K AND reference to possible bromine colour ;	1
2(b)(ii)	ventilated lab / fume cupboard ;	1
2(b)(iii)	add bromine water ; iodide will go darker / orange ; OR add starch ; blue-black ;	2
2(c)(i)	burette / (graduated) pipette ;	1
2(c)(ii)	indicator would be an impurity ;	1
2(c)(iii)	repeat (with indicator and take average volume) ;	1

Question	Answer	Marks
3(a)(i)	$l_0 = 28 \pm 1$;	1
3(a)(ii)	view perpendicular to scale / ruler close to spring / use of fiducial aid ;	1
3(b)	subtraction of two lengths ; 39 (mm) ;	2
3(c)(i)	suitable choice of scales and linear ($\geq$ half the grid used) ; 4 plots correct to half a small square ;	2
3(c)(ii)	good best fit line judgement ;	1
3(c)(iii)	correct intercept read from / axis ± 1 mm and evidence from graph ;	1
3(d)	expect Yes – answers the same / close enough / within 10% / 15% / within experimental error ;	1
3(e)	steeper gradient graph ;	1

Question	Answer	Marks
4(a)(i)	clear outline of cell (not feathery) ; approximately the correct shape and nucleus ; larger than original AND one cell ;	3
4(a)(ii)	nucleus correctly labelled ;	1
4(b)(i)	51 ± 2 ;	1
4(b)(ii)	Drawn line and measure length ;	1
4(b)(iii)	correct calculation of magnification ;	1
4(c)	add alcohol ; pour into water ; white emulsion ;	3

Question	Answer	Marks
5(a)	A D B E ; ; OR A above D ; D above B ; B above E ;	3
5(b)	Green powder in beaker / powder seen / solid in beaker / no more bubbles / gas ;	1
5(c)	filter funnel and filter paper and v shown in filter paper ; filter paper or funnel labelled AND copper carbonate / residue labelled AND copper sulfate / filtrate labelled ;	2
5(d)(i)	to react all of the acid / make sure crystals are pure ;	1
5(d)(ii)	to obtain (large) crystals ;	1
5(e)	(pale) blue ppt ; deep blue solution ;	2

Question	Answer	Marks
6(a)	correct symbol for ammeter and voltmeter ; ammeter in series and voltmeter in parallel correctly ;	2
6(b)(i)	0.12 (A) ; 2.8 (V) ; 12 ONLY(s) ;	3
6(b)(ii)	4.0 ;	1
6(b)(iii)	0.56 ;	1
6(b)(iv)	14 % iii ÷ ii ;	1
6(c)	Energy loss due to resistance (this is the largest) / heat / sound ;	1
6(d)	do more circuits and average / repeat and average ;	1