Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES **0654/61**

Paper 6 Alternative to Practical **October/November 2017**

MARK SCHEME

Maximum Mark: 60

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)	Syringe / burette ;	**1**
1(b)	3 **and** 2 ;	**1**
1(c)	Axes labelled time **and** s (on y) concentration **and** % (on x) ; Suitable linear scale using at least half the grid ; all 4 points plotted correctly ± half small square ; Best fit line ;	**4**
1(d)	Decreasing concentration increases time ORA ;	**1**
1(e)(i)	All temps below 100 ; At least 3 below 50 must be above 0 ;	**2**
1(e)(ii)	**two** from: Volume of milk Same type of milk pH concentration of enzyme volume of enzyme volume of water	**1**

Question	Answer	Marks
2(a)(i)	T_1 21.5 ; T_2 34.0 ;	**2**
2(a)(ii)	(+) 12.5 ;	**1**
2(a)(iii)	exothermic ;	**1**
2(b)(i)	alkaline ;	**1**
2(b)(ii)	limewater / calcium hydroxide / $Ca(OH)_2$;	**1**
2(b)(iii)	sodium hydroxide ;	**1**
2(c)	**(H** is) calcium (oxide) ; **H** + water gives limewater for CO_2 test / calcium oxide reacts exothermically with water / **F** must be calcium hydroxide / **F** is limewater ;	**2**
2(d)	chloride / Cl^- ;	**1**

Question	Answer	Marks
3(a)	1.4 ; 0.32 ;	**2**
3(b)(i)	to prevent wire getting hot / resistance of wire changing / cell running down ;	**1**
3(b)(ii)	ammeter shows a reading ;	**1**
3(c)(i)	W / watt(s) ;	**1**
3(c)(ii)	0.23 **and** 0.17; 2 decimal places ;	**2**
3(d)(i)	a straight line with a positive gradient ; through the origin ;	**2**
3(d)(ii)	(actual values used to show that (for example)), doubling I does not double P ;	**1**

Question	Answer	Marks
4(a)	Root hair ;	**1**
4(b)(i)	Quality drawing using at least half the box ; Nucleus correctly labelled ; Cell wall correctly labelled ;	**3**
4(b)(ii)	34 ± 1 ;	**1**
4(b)(iii)	Measurement to nearest mm ;	**1**
4(b)(iv)	Magnification correctly calculated ;	**1**
4(c)	Starch present ;	**1**
4(d)	select <u>anther</u> ; use a microscope to observe ;	**2**

Question	Answer	Marks
5(a)(i)	6.96 ; 6.85 ;	**2**
5(a)(ii)	0.49 and 0.49 ; + and – ;	**2**
5(b)	any **two** from: stays as blue ; mass changes are the same at the electrodes ; anode dissolves / copper ions from anode go into solution ;	**2**
5(c)(i)	(iron and copper) because copper dissolves from the anode / positive / plates on the cathode / negative ;	**1**
5(c)(ii)	copper sulfate (solution) ;	**1**
5(c)(iii)	smaller pink / orange / copper coloured blue / unchanged ;; all 3 correct = 2 marks; 1 or 2 correct = 1 mark	**2**

Question	Answer	Marks
6(a)(i)	correct position marked ;	**1**
6(a)(ii)	0.87 ;	**1**
6(a)(iii)	data to 2 sf / large variation in raw data ;	**1**
6(b)(i)	0.76, 0.98, 1.21 correct answers only ;	**1**
6(b)(ii)	plots correct to half a small square – at least 4 correct ; good best fit line judgement ;	**2**
6(b)(iii)	indication on graph of how data obtained AND at least half of line used ; correct calculation for triangle method using data from graph ;	**2**
6(c)(i)	correct answer from candidate's gradient value ;	**1**
6(c)(ii)	reduces percentage error in the time / reduces the effect of (human) reaction error ;	**1**