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**CO-ORDINATED SCIENCES**

**0654/52**

Paper 5 Practical Test

**October/November 2016**

MARK SCHEME

Maximum Mark: 45

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**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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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
1(a)	time / minutes ; height / cm ;	<b>2</b>
1(b)	full set of results ; all results to 0.1 cm ; evidence that reaction is slowing at end (not linear increments) ;	<b>3</b>
1(c)	axes labelled with units ; linear scale using at least half the grid ; at least 4 plots correct $\pm$ half small square ; best-fit curve ;	<b>4</b>
1(d)	repeat to see how close results are / repeat to see if get same results ;	<b>1</b>
1(e)	glowing splint ; relights ;	<b>2</b>
1(f)(i)	any <b>two (for one mark)</b> from: volume of hydrogen peroxide concentration of hydrogen peroxide size of celery ;	<b>1</b>
1(f)(ii)	at least five temperatures stated ; at least two temperatures below 40 °C and two temperatures above 40 °C ;	<b>2</b>
	<b>Total:</b>	<b>15</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
2(a)(i)	$T_i$ for concentration 1.00 X ;	<b>1</b>
2(a)(ii)	$T_h$ for concentration 1.00 X recorded to nearest half degree AND above $T_i$ ;	<b>1</b>
2(a)(iii)	brown / pink ; copper / Cu ;	<b>2</b>
2(a)(iv)	$T_i$ for concentration 0.75 X to nearest half degree ;	<b>1</b>
2(a)(v)	$T_h$ for concentration 0.75 X recorded AND $\Delta T$ for 0.75 X lower than $\Delta T$ value for 1.00 X ;	<b>1</b>
2(a)(vi)	remaining $T_i$ and $T_h$ values for 0.50 X and 0.25 X ; $\Delta T$ values decrease down table ;	<b>2</b>
2(b)(i)	all $\Delta T$ values recorded and correct for temperatures recorded (minimum three experiments) ;	<b>1</b>
2(b)(ii)	vertical scale linear and uses more than half of grid ; minimum of 3 points plotted correctly to within half a small square ; best-fit straight line through origin ;	<b>3</b>
2(b)(iii)	data supports statement as points close to straight line / data does not support statement as points are very scattered ;	<b>1</b>
2(c)	exothermic ;	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
2(d)	lid/insulation around flask/rinsing (and drying) of small beaker/extra points/more accurate thermometer ;	<b>1</b>
	<b>Total:</b>	<b>15</b>

<b>Question</b>	<b>Answer</b>	<b>Mark</b>
3(a)(i)	$a$ recorded to the nearest 0.1 cm ;	<b>1</b>
3(a)(ii)	$b$ value correct ( $b = 50 - a - 15 = 35 - a$ ) ;	<b>1</b>
3(a)(iii)	note the reading on either side and find mean/measure cube and mark the centre point ;	<b>1</b>
3(b)	$M$ recorded to the nearest gram ;	<b>1</b>
3(c)	$m$ correct ; 2/3 significant figures ;  independent marks	<b>2</b>
3(d)(i)	$a_L$ and $b_L$ recorded to the nearest millimetre ; $a_L > b_L$ ;	<b>2</b>
3(d)(ii)	$m_L$ calculation correct ;	<b>1</b>
3(e)(i)	$a_S$ and $b_S$ recorded ;	<b>1</b>
3(e)(ii)	$m_S$ calculation correct ; $m_S < m_L$ ;	<b>2</b>
3(f)	addition correct ;	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
3(g)	any <b>two</b> from: centre of gravity of the rule not at the 50 cm mark / difficulty in obtaining balance / rounding errors / pivot not perpendicular to edge of rule / centre of gravity of cube not over the mark due to irregular shape ; ;	<b>2</b>
	<b>Total:</b>	<b>15</b>