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**CO-ORDINATED SCIENCES**

**0654/61**

Paper 6 Alternative to Practical

**October/November 2018**

MARK SCHEME

Maximum Mark: 60

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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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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This document consists of **9** printed pages.

**PUBLISHED****Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

**GENERIC MARKING PRINCIPLE 1:**

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

**GENERIC MARKING PRINCIPLE 2:**

Marks awarded are always **whole marks** (not half marks, or other fractions).

**GENERIC MARKING PRINCIPLE 3:**

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

**GENERIC MARKING PRINCIPLE 4:**

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

**GENERIC MARKING PRINCIPLE 5:**

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

**GENERIC MARKING PRINCIPLE 6:**

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)(i)	smooth continuous outline ; bigger than original ; correct number of spikes ;	<b>3</b>
1(a)(ii)	50 ;	<b>1</b>
1(a)(iii)	(correct placement of AB on drawing <b>and</b> ) line <b>and</b> measured to nearest mm ;	<b>1</b>
1(a)(iv)	correct calculation ;	<b>1</b>
1(b)(i)	heat in alcohol / water ; alcohol ; iodine solution ;	<b>3</b>
1(b)(ii)	blue-black;	<b>1</b>

Question	Answer	Marks
2(a)(i)	1°C ;	1
2(a)(ii)	35.5 ;	1
2(a)(iii)	temperature could have been higher between readings / do not know where peak really is ;	1
2(a)(iv)	take more frequent readings / plot a graph and draw best-fit line ;	1
2(b)(i)	use $25 \times 4.2 \times \text{(a)(ii)}$ = value ; correct answer to 2 sf = 3700 ;	2
2(b)(ii)	insulation around cup / lid ; less heat lost to surroundings ;	2
2(c)	add ammonia solution ; blue ppt (soluble in excess) / dark blue solution ; <b>OR</b> sodium hydroxide solution ; blue ppt.(insoluble in excess) ;	<b>max 2</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(a)	55 mm ;	<b>1</b>
3(b)	$l_1 = 137$ mm and $e = 82$ mm ;	<b>1</b>
3(c)	0.44 ;	<b>1</b>
3(d)(i)	suitable choice of scales ( $\geq$ half the grid used) and starting at 0,0 ; 3 plots correct to half a small square ;	<b>2</b>
3(d)(ii)	good best-fit line judgement ;	<b>1</b>
3(d)(iii)	indication on graph of how data were obtained AND more than half the line used ; correct calculation ;	<b>2</b>
3(d)(iv)	correct calculation of $g$ ;	<b>1</b>
3(e)	view perpendicularly to rule / scale / equivalent; rule close to spring ; use of fiducial marker;	<b>1</b>

Question	Answer	Marks
4(a)(i)	3.4 ; 7.9 ;	<b>2</b>
4(a)(ii)	3.4 ;	<b>1</b>
4(a)(iii)	0.11 ;	<b>1</b>
4(b)	oxygen used up ; carbon dioxide made removed (by soda lime) ;	<b>2</b>
4(c)	prevent air entering / allows bubble to move / to make apparatus airtight ; provide air / oxygen (for maggots) / freeze final bubble position AW ;	<b>2</b>
4(d)	<i>any two from</i> temperature ; number of maggots ; mass of maggots ; (same) maggots ;	<b>max 2</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(a)	measuring cylinder / burette / pipette ;	<b>1</b>
5(b)	beaker <b>and</b> liquid <b>and on</b> tripod <b>and</b> heat ; 3 correct labels ;	<b>2</b>
5(c)	black powder in beaker / undissolved solid in beaker / solid in beaker ;	<b>1</b>
5(d)	2 of filter paper / funnel / (evaporating) basin labelled ; copper oxide / residue AND copper sulfate (solution) / filtrate labelled ;	<b>2</b>
5(e)	to form crystals / not to form powder / so doesn't decompose ;	<b>1</b>
5(f)	used excess copper oxide / wash (well) with (ice cold) distilled water ;	<b>1</b>
5(g)	so the crystals don't dissolve / only small amount crystals dissolve ;	<b>1</b>
5(h)	water ;	<b>1</b>



<b>Question</b>	<b>Answer</b>	<b>Marks</b>
6(a)(i)	96.5 ;	<b>1</b>
6(a)(ii)	94.6 ;	<b>1</b>
6(b)(i)	both axes labelled with units ; minimum 5 plots correct ;	<b>2</b>
6(b)(ii)	point at 8% circled ;	<b>1</b>
6(b)(iii)	best-fit line AND not including anomaly ;	<b>1</b>
6(c)	answer from their line in <b>(b)(iii)</b> AND this marked on graph ;	<b>1</b>
6(d)	repeat values and average / repeat to identify anomalies / repeat values to reduce effect of errors / thinner measuring cylinder ;	<b>1</b>
6(e)	difficult to get exactly 100 cm <sup>3</sup> ;	<b>1</b>
6(f)	bubbles take up volume / amount bubbles vary / bubbles change mass / difficult to measure volume ;	<b>1</b>