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**CO-ORDINATED SCIENCES****0654/51**

Paper 5 Practical Test

**October/November 2018**

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.

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 **6** 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.

Question	Answer	Marks
1(a)	continuous outline; detail e.g. vein; length of leaf drawn 70 mm or more;	<b>3</b>
1(b)(i)	value entered to nearest mm;	<b>1</b>
1(b)(ii)	measurement from drawing correct;	<b>1</b>
1(b)(iii)	correct calculation of magnification;	<b>1</b>
1(c)(i)	(place in) hot (liquid); alcohol; iodine (solution); blue-black;	<b>4</b>
1(c)(ii)	water bath / not naked flame; because alcohol/ethanol is flammable; <b>OR</b> cut away from hand ; to avoid cuts; <b>OR</b> wash hands / avoid contact; to remove iodine / iodine stains / iodine solution is irritant / iodine solution is harmful;	<b>2</b>
1(d)	count number on upper and lower epidermis/surface; repeat for same species; then use different species;	<b>3</b>

Question	Answer	Marks						
2(a)(i)	temperature for $t = 0$ to nearest $0.5\text{ }^{\circ}\text{C}$ ;	1						
2(a)(ii)	all readings entered; maximum by 2.0 min / SV time plus 0.5 min <b>AND</b> only one maximum; <table border="1"> <thead> <tr> <th>observations</th> <th>solid H</th> <th>solution J</th> </tr> </thead> <tbody> <tr> <td>(after the reaction)</td> <td>brown / darker grey / black;</td> <td>colourless / paler blue / grey;</td> </tr> </tbody> </table>	observations	solid H	solution J	(after the reaction)	brown / darker grey / black;	colourless / paler blue / grey;	4
observations	solid H	solution J						
(after the reaction)	brown / darker grey / black;	colourless / paler blue / grey;						
2(b)(i)	correct rise in temperature;	1						
2(b)(ii)	temperature could have been higher between readings;	1						
2(b)(iii)	take readings more frequently (than every 0.5 min) / plot a graph and draw best-fit line;	1						
2(c)(i)	use $25 \cdot 4.2 \cdot \text{(b)(i)}$ ; correct answer to 2sf;	2						
2(c)(ii)	insulation around cup / lid; less heat lost to surroundings;	2						
2(d)(i)	(light) blue ppt. <b>AND</b> dark blue solution;	1						
2(d)(ii)	copper (ion) / $\text{Cu}^{2+}$ / copper(II); brown solid in <b>(a)(ii)</b> / <b>J</b> is a blue solution / copper is displaced in first reaction;	2						

Question	Answer	Marks
3(a)	$l_0$ recorded to the nearest millimetre <b>AND</b> at least 10 mm;	1
3(b)	$l_1$ recorded for $m = 200$ g <b>AND</b> $l_1 > l_0$ <b>AND</b> $e$ correctly calculated;	1
3(c)(i)	$t$ value recorded in the table for $m = 200$ ;	1
3(c)(ii)	all $t$ values present <b>AND</b> increasing;	1
3(c)(iii)	all $T$ values correct for $t$ values present;	1
3(c)(iv)	all $T^2$ values correct for $T$ values present;	1
3(d)(i)	axes labelled with units; suitable choice of scales with $\geq$ half the grid used <b>AND</b> starting at (0,0) ; at least 3 plots correct to half a small square;	3
3(d)(ii)	good best-fit straight line judgement;	1
3(d)(iii)	indication on graph of how data were obtained <b>AND</b> more than half the line used; correct calculation;	2
3(d)(iv)	correct calculation of $g$ ;	1
3(e)	view perpendicularly to rule / scale / AVP;	1
3(f)	yes – close enough / within 10% / both close to 10;	1