Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES	**0654/52**
Paper 5 Practical Test	**May/June 2019**
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.

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

Cambridge International is publishing the mark schemes for the May/June 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

Cambridge Assessment
International Education

[Turn over

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)	<table><tr><td rowspan="2">test solution</td><td colspan="2">observations</td></tr><tr><td>solution **A**</td><td>solution **B**</td></tr><tr><td>iodine solution</td><td>blue-black ;</td><td>orange/brown ;</td></tr></table>	2
1(b)	<table><tr><td rowspan="2">test solution</td><td colspan="2">observations</td></tr><tr><td>solution **A**</td><td>solution **B**</td></tr><tr><td>biuret solution</td><td>blue ;</td><td>purple/lilac ;</td></tr></table>	2
1(c)	**A** contains starch ; **B** contains protein ;	2
1(d)	pour into water (to get cloudy effect) ;	1

Question	Answer	Marks
2(a)(i)	volume remaining for experiment 1 $\geqslant$ 10 cm^3 ; recorded to nearest 0.5 cm^3 ;	**2**
2(a)(ii)	both volumes remaining for experiments 2 and 3 ;	**1**
2(b)(i)	all values of *V* correct ;	**1**
2(b)(ii)	values selected within 0.5 cm^3 of each other (accuracy mark) ; suitable justification in terms of closeness of values ;	**2**
2(b)(iii)	correct average of selected values of *V* ;	**1**
2(b)(iv)	correct answer for *C* (ignoring sf) ; answer to 2 significant figures ;	**2**
2(c)	use a burette / pipette / replace test-tube with measuring cylinder ;	**1**

Question	Answer	Marks
3(a)(i)	*V* value < 2.5 V and to at least 1 d.p. ;	1
3(a)(ii)	all *V* values recorded and increasing ;	1
3(a)(iii)	*I* value < 0.5 A and to at least 2 d.p. ;	1
3(b)	suitable choice of scales ($\geqslant$ half the grid used) – must start from (0, 0) ; 4 plots correct to half a small square ; good best-fit line judgement ;	3
3(c)	intercept correct from candidate's graph $\pm$ half a small square ;	1
3(d)	calculation of resistance correct ; **R** = $(5 \pm 1)\ \Omega$;	2
3(e)	difficult to measure to nearest mm / zero error on voltmeter or ammeter / difficult to read (an analogue) scale with precision / cell might run down / finite width of contact on crocodile clip / cannot place the crocodile clip accurately ;	1

Question	Answer	Marks
4(a)	clear and continuous outline ; Surface detail and long side over half the size of the box in one dimension ;	**2**
4(b)(i)	correct measurement of d_1 on drawing ;	**1**
4(b)(ii)	measurement and in mm ;	**1**
4(b)(iii)	correct calculation of d_2 ;	**1**
4(b)(iv)	correct calculation of magnification ;	**1**

Question	Answer	Marks
5(a)(i)	time for concentration 2.0 ;	1
5(a)(ii)	time for concentration 1.5 **and** in seconds to the nearest second ;	1
5(a)(iii)	time for concentration 1.0 **and** times increase down Table ;	1
5(a)(iv)	(hydrochloric acid) = 2.5 **and** (water =) 7.5 ;	1
5(b)(i)	rate decreases as concentration decreases ;	1
5(b)(ii)	need more points if plot a graph / if one is misread two is not enough for a trend / too narrow a range / one point may be anomalous ;	1
5(b)(iii)	repeat each concentration of (acid and take average) / use same volume of water (with detergent) ; use pipette or burette for measuring volumes / same mass of marble chips / control the temperature ;	2
5(c)	collect gas above water / collect gas in a gas syringe / reaction vessel on a mass balance / bubble into limewater ; (time for) volume of gas / (time for) mass / (time to) go cloudy ;	2

Question	Answer	Marks
6(a)(i)	initial temperature present, sensible value ;	1
6(a)(ii)	all values of θ present ; θ values decreasing ;	2
6(b)	read at 90° / eye level perpendicular to the scale / stir before reading / keep thermometer at same level / thermometer not touching the sides/bottom of the beaker ;	1
6(c)(i)	θ_X correct ;	1
6(c)(ii)	R_1 correct and to 2 / 3 significant figures ;	1
6(d)	all values of θ present and a greater change of temperature ;	1
6(e)	R_2 correct ;	1
6(f)	smaller volume has greater temperature change / smaller amount of water cools more quickly ; quoting data from the table i.e. temperatures quoted for the same time	2

Question	Answer	Marks
7	**Method** heat ; Benedict's solution ; **Safety** waterbath (not naked flame) / goggles ; **Variables** same volume of food solution ; same volume / concentration of testing solution ; run test for the same time ; **Observations** start / negative is blue ; positive is green / yellow / orange / red ; **Conclusion** colours in order: yellow / green – orange – red ;	**max 7**