



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES

0654/51

Paper 5 Practical Test

October/November 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 October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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.

Question	Answer	Marks						
1(a)	to release the enzyme / break open cells / to increase surface area / increase rate of reaction ;	1						
1(b)(i)	time recorded for trial 1 ;	1						
1(b)(ii)	times recorded for trial 2 and 3 ;	1						
1(b)(iii)	correct calculation of mean ;	1						
1(c)	gas tight and works and safe ;	1						
1(d)	glowing splint ; relights ;	2						
1(e)	<table border="1" data-bbox="322 639 1364 772"> <tbody> <tr> <td data-bbox="322 639 602 703">Benedict's solution</td> <td data-bbox="602 639 1003 703">yellow / green / orange / red ;</td> <td data-bbox="1003 639 1364 703">reducing sugar present ;</td> </tr> <tr> <td data-bbox="322 703 602 772">biuret solution</td> <td data-bbox="602 703 1003 772">purple / lilac ;</td> <td data-bbox="1003 703 1364 772">protein present ;</td> </tr> </tbody> </table>	Benedict's solution	yellow / green / orange / red ;	reducing sugar present ;	biuret solution	purple / lilac ;	protein present ;	4
Benedict's solution	yellow / green / orange / red ;	reducing sugar present ;						
biuret solution	purple / lilac ;	protein present ;						
1(f)	ethanol and water ; white emulsion ;	2						

Question	Answer	Marks
2	<p>apparatus pond weed in container of water ;</p> <p>method use of one light source on its own ; all three light sources used separately ; repeats, i.e. more than one set of results ;</p> <p>measure number of bubbles / volume of gas produced ; in a set time ; or time; collect set volume of gas / number of bubbles ;</p> <p>control same plant / same amount / same species of plant; same distance of lamp from plant / same light intensity; same temperature ; same water source ; same carbon dioxide concentration ; no contamination from other light sources ;</p> <p>conclusion greatest volume of gas / number of bubbles or shorter time to collect is colour / light that gives greatest rate ORA ;</p> <p>Max 7</p>	7

Question	Answer	Marks
3(a)(i)	time recorded for 10 marble chips ;	1
3(a)(ii)	full set of times ; times decrease down Table 4.1 ; at least 2 readings to nearest second ;	3
3(b)(i)	$\frac{1}{t}$ values recorded for all times ; all to 2 sf ;	2
3(b)(ii)	the greater the surface area the greater the rate ;	1
3(c)(i)	any ONE of: volume / amount / concentration of acid ; temperature of acid ; volume / amount of limewater ;	1
3(c)(ii)	chips not exactly the same size ;	1
3(c)(iii)	timing to the same milkiness (opaqueness of ppt.) in limewater / time delay between replacing the bung and starting the clock / gas escaping whilst bung being replaced ;	1

Question	Answer	Marks
4(a)(i)	T_1 recorded to nearest 0.5 °C ;	1
4(a)(ii)	T_2 recorded and lower than T_1 ; colourless solution ;	2
4(a)(iii)	correct ΔT with appropriate sign ;	1
4(a)(iv)	H is soluble in water / H dissolves ; absorbs heat / endothermic ;	2
4(b)(i)	(nitric acid) no reaction and (barium nitrate) no reaction ; not a sulfate ;	2
4(b)(ii)	(silver nitrate) white ppt. ; chloride / Cl^- ;	2

Question	Answer	Marks
5(a)(i)	<i>l, w, h</i> values present ; to nearest 0.1 cm ;	2
5(a)(ii)	<i>V</i> correct ;	1
5(b)(i)	block is not a regular shape / corresponding sides unequal / difficult to measure because sides not straight / ruler only reads to the nearest mm ;	1
5(b)(ii)	use a measuring cylinder / displacement can / displacement of water ;	1
5(c)(i)	<i>x</i> present ; < 35.0 cm ;	2
5(c)(ii)	<i>m</i> correct and rounded correctly ;	1
5(d)(i)	difficult to obtain an exact balance / centre of block difficult to place over mark ;	1
5(d)(ii)	<i>d</i> value 1.5–3.5 (g / cm ³) ;	1

Question	Answer	Marks
6(a)	<i>I</i> to at least 2 d.p. and $< 1 \text{ A}$; <i>V</i> to at least 1 d.p. and $< 3 \text{ V}$;	2
6(b)	<i>R</i> calculation correct ;	1
6(c)	table completed ; <i>V</i> and <i>R</i> values increasing ;	2
6(d)(i)	suitable choice of scales (\geq half the grid used) ; all plots correct to half a small square ;	2
6(d)(ii)	good best-fit line judgement ;	1
6(e)(i)	(expect yes) (straight) line through the origin ;	1
6(e)(ii)	extend the investigation / more readings (for greater values) of <i>I</i> / repeats ;	1