



CO-ORDINATED SCIENCES

0654/51

Paper 5 Practical Test

May/June 2018

MARK SCHEME

Maximum Mark: 45

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.

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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)(i)	seconds / s ; cm ³ ;	2
1(a)(ii)	results for t = 30 seconds ; full set of results ; recorded to nearest 1 cm ³ ;	3
1(b)(i)	axes labelled with units ; at least four points plotted correctly $\pm \frac{1}{2}$ a small square ;	2
1(b)(ii)	smooth curve ;	1
1(c)(i)	correct reading from graph ;	1
1(c)(ii)	decreases (from appropriate results) ;	1
1(d)	gloves because enzyme present / goggles to protect eyes from splashes ;	1
1(e)	same volume of peroxide / same volume of butter bean puree / same batch of puree / same time ; minimum of 5 different temperatures of peroxide ; sensible range of temperatures of peroxide solution ; graph of volume against time for each temperature / volume in fixed time against temperature of peroxide ;	4

Question	Answer				Marks												
2(a)(i)	<table border="1"> <thead> <tr> <th data-bbox="322 220 609 268">test</th> <th data-bbox="622 220 927 268">solution H</th> <th data-bbox="927 220 1227 268">solution J</th> <th data-bbox="1227 220 1527 268">solution K</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 268 609 354">(add silver nitrate solution)</td> <td data-bbox="622 268 927 354">white ppt. ;</td> <td data-bbox="927 268 1227 354">(pale) yellow ppt. ;</td> <td data-bbox="1227 268 1527 354">cream ppt. / off-white ppt. ;</td> </tr> <tr> <td data-bbox="322 354 609 472">(add excess ammonia solution and stir)</td> <td data-bbox="622 354 927 472">ppt. disappears / colourless solution ;</td> <td data-bbox="927 354 1227 472">pale yellow ppt. remains ;</td> <td data-bbox="1227 354 1527 472">ppt. partially disappears ;</td> </tr> </tbody> </table>	test	solution H	solution J	solution K	(add silver nitrate solution)	white ppt. ;	(pale) yellow ppt. ;	cream ppt. / off-white ppt. ;	(add excess ammonia solution and stir)	ppt. disappears / colourless solution ;	pale yellow ppt. remains ;	ppt. partially disappears ;				6
test	solution H	solution J	solution K														
(add silver nitrate solution)	white ppt. ;	(pale) yellow ppt. ;	cream ppt. / off-white ppt. ;														
(add excess ammonia solution and stir)	ppt. disappears / colourless solution ;	pale yellow ppt. remains ;	ppt. partially disappears ;														
2(a)(ii)	H AND white ppt. (with silver nitrate) ;				1												
2(a)(iii)	yes AND different coloured ppts. / different overall test results OR no AND some ppts. almost the same in colour ;				1												
2(a)(iv)	no need to eliminate carbonate / cannot be a carbonate ;				1												
2(b)(i)	<table border="1"> <thead> <tr> <th data-bbox="322 777 609 888">test</th> <th data-bbox="622 777 927 888">solution H</th> <th data-bbox="927 777 1227 888">solution J</th> <th data-bbox="1227 777 1527 888">solution K</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 888 609 975">(add chlorine water)</td> <td data-bbox="622 888 927 975">no reaction / slightly yellow</td> <td data-bbox="927 888 1227 975">yellow / orange / brown</td> <td data-bbox="1227 888 1527 975">no change / yellow / orange</td> </tr> <tr> <td data-bbox="322 975 609 1093">(then add a few drops of starch solution)</td> <td data-bbox="622 975 927 1093">(no change)</td> <td data-bbox="927 975 1227 1093">blue-black</td> <td data-bbox="1227 975 1527 1093">(no change)</td> </tr> </tbody> </table>	test	solution H	solution J	solution K	(add chlorine water)	no reaction / slightly yellow	yellow / orange / brown	no change / yellow / orange	(then add a few drops of starch solution)	(no change)	blue-black	(no change)				3
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(add chlorine water)	no reaction / slightly yellow	yellow / orange / brown	no change / yellow / orange														
(then add a few drops of starch solution)	(no change)	blue-black	(no change)														
solution H AND solution K correct ; solution J chlorine water test result correct ; solution J starch solution result correct ;																	
2(b)(ii)	iodine / I ₂ ;				1												
2(b)(iii)	(halogen) displacement / redox ;				1												
2(c)	(H is chloride) J is (sodium) iodide AND K is (sodium) bromide ;				1												

Question	Answer	Marks
3(a)(i)	l_0 recorded to the nearest millimetre ;	1
3(a)(ii)	sensible distance, carefully marked ;	1
3(a)(iii)	view perpendicular to scale / view scale at eye level / ruler close to spring / use of fiducial aid ;	1
3(b)(i)	l present in the table for 1.0 N ;	1
3(b)(ii)	all readings present ; lengths increasing down table ;	2
3(c)(i)	suitable choice of scales (\geq half the grid used) ; at least 4 points plotted correctly to $\frac{1}{2}$ a small square ;	2
3(c)(ii)	good best-fit straight line judgement ;	1
3(c)(iii)	correct intercept read from l axis $\pm \frac{1}{2}$ a small square ;	1
3(c)(iv)	yes AND because the same / close enough ;	1
3(d)(i)	indication on graph of how data were obtained AND more than half the line used ; correct calculation to minimum 2 sig fig ;	2
3(d)(ii)	same intercept on l axis ; steeper gradient graph ;	2