



BIOLOGY

0610/53

Paper 5 Practical Test

May/June 2017

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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This document consists of **6** printed pages.

Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- **ecf** credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- () the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

Question	Answer	Marks	Guidance
1(a)	table with 2 columns ; column 1 heading 'vegetable extract' column 2 headed volume of iodine and column 2 units – cm ³ ; correct trend ;	3	
1(b)	to allow iodine to change colour ;	1	A as an indicator
1(c)	volume of vegetable extract ; volume / concentration of starch solution ; concentration of iodine ; temperature; mixing time;	2	I amount R volume iodine solution

Question	Answer	Marks	Guidance														
1(d)	<table border="1"> <tr> <td data-bbox="349 248 853 300">source of error ;;</td> <td data-bbox="855 248 1355 300">improvement ;;</td> </tr> <tr> <td data-bbox="349 301 853 384">contamination</td> <td data-bbox="855 301 1355 384">washing all apparatus / use new syringes</td> </tr> <tr> <td data-bbox="349 386 853 469">overshoot of end-point / adding too much iodine / many drops</td> <td data-bbox="855 386 1355 469">add smaller quantities of iodine</td> </tr> <tr> <td data-bbox="349 470 853 585">determination of end-point</td> <td data-bbox="855 470 1355 585">allow sufficient time for colour to change / use colorimeter / colour standard</td> </tr> <tr> <td data-bbox="349 587 853 670">change in vitamin C with time</td> <td data-bbox="855 587 1355 670">test same time after extraction for each</td> </tr> <tr> <td data-bbox="349 671 853 722">no repeats</td> <td data-bbox="855 671 1355 722">repeat each concentration</td> </tr> <tr> <td data-bbox="349 724 853 807">AVP e.g. difficult reading scale coloured vegetable extracts</td> <td data-bbox="855 724 1355 807">AVP e.g. use burette</td> </tr> </table>	source of error ;;	improvement ;;	contamination	washing all apparatus / use new syringes	overshoot of end-point / adding too much iodine / many drops	add smaller quantities of iodine	determination of end-point	allow sufficient time for colour to change / use colorimeter / colour standard	change in vitamin C with time	test same time after extraction for each	no repeats	repeat each concentration	AVP e.g. difficult reading scale coloured vegetable extracts	AVP e.g. use burette	4	improvement must relate to given error A subjective colour change
source of error ;;	improvement ;;																
contamination	washing all apparatus / use new syringes																
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AVP e.g. difficult reading scale coloured vegetable extracts	AVP e.g. use burette																
1(e)(i)	<p>L: 25.00 ;</p> <p>N: 62.5 ;</p> <p>correct number of decimal places on both ;</p>	3															
1(e)(ii)	<p>axes labelled and units;</p> <p>even scale to fill more than half of printed grid ;</p> <p>plot three / four points correctly ;</p> <p>line of best fit / trend line ;</p>	4	ecf candidate result for 1(e)(i)														

Question	Answer	Marks	Guidance
1(e)(iii)	mark volume of iodine used on (y axis of) graph / extend horizontally and extend line vertically from plotted point to x axis ; correct reading from graph on answer line ;	2	
1(f)	range of temperatures ; values for temperatures stated ; time at each temperature ; use of water bath / named method ; description of extracting juice ; detail of use of iodine drops / volume / addition of starch for end point ;; at least two repeats ; (controlled variables) heating time / same type of vegetable / all samples from same vegetable ; relevant reference to safety ;	6	minimum of three at least one above 50

Question	Answer	Marks	Guidance
2(a)	<i>any four from:</i> drawing with clear outline ; scaled to fit more than half the space ; shape 5 / 6 sides for both ; detail showing 3 / 4 layers with no shading and no cells ;	4	
2(b)(i)	length of PQ = 80 mm ; (x)64 ;;	3	$\pm 1\text{mm}$ $(80) \div 1.25$
2(b)(ii)	plane of section ; AW magnification ; number of villi different;	2	
2(c)(i)	A: 3 B: 9 C: 11 ;	1	A 2 instead of 3 for A 3 correct answers = 1 mark
2(c)(ii)	30 °C ; has highest rate of reaction / AW ;	2	
2(c)(iii)	it is much higher / different than trial 1 and 3 / AW ;	1	
2(c)(iv)	(IV) temperature ; (DV) rate of reaction ;	2	