



BIOLOGY

0610/63

Paper 6 Alternative to Practical

October/November 2017

MARK SCHEME

Maximum Mark: 40

Published

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

Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- I ignore
- R reject
- A accept (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)(i)	<table border="1"> <thead> <tr> <th></th> <th>type of fruit</th> <th>volume of juice / cm³</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>orange</td> <td>13</td> </tr> <tr> <td>2</td> <td>grapefruit</td> <td>18</td> </tr> <tr> <td>3</td> <td>lemon</td> <td>7</td> </tr> </tbody> </table> ;		type of fruit	volume of juice / cm ³	1	orange	13	2	grapefruit	18	3	lemon	7	1	Ignore units in table A 13.0, 18.0, 7.0
	type of fruit	volume of juice / cm ³													
1	orange	13													
2	grapefruit	18													
3	lemon	7													
1(a)(ii)	table drawn with (ruled) lines, appropriate columns and (heading) underlined ; suitable headings ; all colours recorded for start and end;	3													
1(a)(iii)	Benedict's (reagent) ;	1													
1(a)(iv)	80 °C ;	1													
1(a)(v)	orange and grapefruit ;	1													
1(a)(vi)	idea of looking for colour change (as the starting colour may not be blue) ;	1													
1(b)	<table border="1"> <thead> <tr> <th><i>variable</i></th> <th><i>controlled by</i></th> </tr> </thead> <tbody> <tr> <td>volume of fruit juice</td> <td>measuring 2 cm³ for all</td> </tr> <tr> <td>volume of Benedict's / solution</td> <td>measuring 2 cm³ for all</td> </tr> <tr> <td>time in water-bath</td> <td>five minutes in water-bath</td> </tr> <tr> <td>temperature</td> <td>thermostatically controlled / maintained water-bath</td> </tr> </tbody> </table> ; ;	<i>variable</i>	<i>controlled by</i>	volume of fruit juice	measuring 2 cm ³ for all	volume of Benedict's / solution	measuring 2 cm ³ for all	time in water-bath	five minutes in water-bath	temperature	thermostatically controlled / maintained water-bath	2	one mark for the variable, one mark for method of controlling which must related		
<i>variable</i>	<i>controlled by</i>														
volume of fruit juice	measuring 2 cm ³ for all														
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Question	Answer	Marks	Guidance																				
1(c)	<table border="1"> <tr> <td data-bbox="322 217 745 268">error</td> <td data-bbox="745 217 1167 268">improvement</td> </tr> <tr> <td data-bbox="322 268 745 352">temperature of water-bath</td> <td data-bbox="745 268 1167 352">any method of keeping the temperature the same</td> </tr> <tr> <td data-bbox="322 352 745 403">judging colour by eye</td> <td data-bbox="745 352 1167 403">colour standard / colorimeter</td> </tr> <tr> <td data-bbox="322 403 745 488">idea of age of fruit differs</td> <td data-bbox="745 403 1167 488">use fruit of the same age / ripeness</td> </tr> <tr> <td data-bbox="322 488 745 572">Benedict's and juice mixed at different times</td> <td data-bbox="745 488 1167 572">test each fruit separately / get other people to add solutions</td> </tr> <tr> <td data-bbox="322 572 745 657">no replicates / repeats</td> <td data-bbox="745 572 1167 657">at least <u>2</u> more replicates / repeats needed</td> </tr> <tr> <td data-bbox="322 657 745 708">no control</td> <td data-bbox="745 657 1167 708">do with no vitamin C / water</td> </tr> <tr> <td data-bbox="322 708 745 759">contamination</td> <td data-bbox="745 708 1167 759">wash apparatus</td> </tr> <tr> <td data-bbox="322 759 745 810">no mixing</td> <td data-bbox="745 759 1167 810">method of mixing given</td> </tr> <tr> <td data-bbox="322 810 745 861">solids in the juice</td> <td data-bbox="745 810 1167 861">Filter</td> </tr> </table> <p style="text-align: right;">****</p>	error	improvement	temperature of water-bath	any method of keeping the temperature the same	judging colour by eye	colour standard / colorimeter	idea of age of fruit differs	use fruit of the same age / ripeness	Benedict's and juice mixed at different times	test each fruit separately / get other people to add solutions	no replicates / repeats	at least <u>2</u> more replicates / repeats needed	no control	do with no vitamin C / water	contamination	wash apparatus	no mixing	method of mixing given	solids in the juice	Filter	4	one mark for error, one mark for improvement which must match
error	improvement																						
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1(d)	<p>add biuret ;</p> <p>(blue) to lilac / mauve / purple / violet for positive test ;</p>	2																					

Question	Answer	Marks	Guidance
1(e)	<p><i>any six from:</i></p> <ol style="list-style-type: none"> 1 at least two temperatures / or stated temperatures ; 2 use of water-bath ; 3 same volume juice ; 4 same fruit used ; 5 same time / stated time ; 6 add DCPIP ; 7 measure number of drops of DCPIP ; 8 control (no vitamin C / water) ; 9 repeats ; 10 safety ; 	6	<p>A iodine titration method if independent variable is time heated:</p> <ol style="list-style-type: none"> 1 stated temperature > 80°C 2 use of water-bath ; 3 time intervals (at least two) ; 4 same volume juice ; 5 same fruit used ; 6 add DCPIP ; 7 measure number of drops of DCPIP ; 8 control (no vitamin C / water) ; 9 repeats ; 10 safety ;
1(f)	<p>O single clear lines with no shading ;</p> <p>S at least 80 mm in diameter ;</p> <p>D1 inner star shape shown ;</p> <p>D2 8–16 segments shown ;</p>	4	

Question	Answer	Marks	Guidance
2(a)(i)	18.4 ;;	2	working $\frac{18 + 17 + 19 + 20 + 18}{5} / \frac{92}{5} = 1$ mark
2(a)(ii)	5 circled on Table 2.1 ; 12.8 ;	2	<p>ecf if incorrect result circled</p> <p>A 12.7</p>

Question	Answer	Marks	Guidance
2(a)(iii)	A (xes) – labelled with units ; S (cale) – even scales on both axes; P (lot) – all points plotted accurately \pm half a small square ; L (ines) – line ;	4	
2(a)(iv)	low concentrations increase root growth ; high concentrations decrease root growth ; 0.4% identified as the concentration that produces longest root growth ; correct data quote with units ;	3	ecf for incorrect graph
2(b)	(length of MN) 30 ± 1 mm ; 0.25 mm ;;	3	ecf for incorrect measurement