Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/63**

Paper 6 Alternative to Practical **October/November 2017**

MARK SCHEME

Maximum Mark: 40

Published

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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

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(a)(i)</td><td><table><tr><th></th><th>type of fruit</th><th>volume of juice / cm^3</th></tr><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></table>;</td><td>1</td><td>Ignore units in table

A 13.0, 18.0, 7.0</td></tr>
<tr><td>1(a)(ii)</td><td>table drawn with (ruled) lines, appropriate columns and (heading) underlined ;

suitable headings ;

all colours recorded for start and end;</td><td>3</td><td></td></tr>
<tr><td>1(a)(iii)</td><td>Benedict’s (reagent) ;</td><td>1</td><td></td></tr>
<tr><td>1(a)(iv)</td><td>80 °C ;</td><td>1</td><td></td></tr>
<tr><td>1(a)(v)</td><td>orange and grapefruit ;</td><td>1</td><td></td></tr>
<tr><td>1(a)(vi)</td><td>idea of looking for colour change (as the starting colour may not be blue) ;</td><td>1</td><td></td></tr>
<tr><td>1(b)</td><td><table><tr><th>variable</th><th>controlled by</th></tr><tr><td>volume of fruit juice</td><td>measuring 2 cm^3 for all</td></tr><tr><td>volume of Benedict’s / solution</td><td>measuring 2 cm^3 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></table>; ;</td><td>2</td><td>one mark for the variable, one mark for method of controlling which must related</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(c)</td><td>
<table>
<tr><td>error</td><td>improvement</td></tr>
<tr><td>temperature of water-bath</td><td>any method of keeping the temperature the same</td></tr>
<tr><td>judging colour by eye</td><td>colour standard / colorimeter</td></tr>
<tr><td>idea of age of fruit differs</td><td>use fruit of the same age / ripeness</td></tr>
<tr><td>Benedict’s and juice mixed at different times</td><td>test each fruit separately / get other people to add solutions</td></tr>
<tr><td>no replicates / repeats</td><td>at least 2 more replicates / repeats needed</td></tr>
<tr><td>no control</td><td>do with no vitamin C / water</td></tr>
<tr><td>contamination</td><td>wash apparatus</td></tr>
<tr><td>no mixing</td><td>method of mixing given</td></tr>
<tr><td>solids in the juice</td><td>Filter</td></tr>
</table>
;;;;</td><td>4</td><td>one mark for error, one mark for improvement which must match</td></tr>
<tr><td>1(d)</td><td>add biuret ;

(blue) to lilac / mauve / purple / violet for positive test ;</td><td>2</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
1(e)	*any six from:* 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**	**A** iodine titration method if independent variable is time heated: 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)	**O** single clear lines with no shading **;** **S** at least 80 mm in diameter **;** **D1** inner star shape shown **;** **D2** 8–16 segments shown **;**	**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**	**ecf** if incorrect result circled **A** 12.7

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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 ± 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

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