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

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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This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

<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>

<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>

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

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