



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

0610/62

Paper 6 Alternative to Practical

May/June 2016

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 **8** printed pages.

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- **R** reject
- **ignore** ignore (mark as if this material was not present)
- **A** accept (a less than ideal answer which should be marked correct)
- **AW** alternative wording (accept other ways of expressing the same idea)
- underline words underlined (or grammatical variants of them) must be present
- **max** indicates the maximum number of marks that can be awarded
- **mark independently** the second mark may be given even if the first mark is wrong
- **ecf** error carried forward (credit a correct statement that follows a previous wrong response)
- () the word / phrase in brackets is not required, but sets the context
- **ora** or reverse argument
- **AVP** any valid point

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Question	Mark scheme	Mark	Guidance												
1 (a) (i)	Biuret ;	[1]													
(ii)	<table border="1"> <thead> <tr> <th>food supplement</th> <th>colour at start</th> <th>colour at end</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>blue</td> <td>lilac</td> </tr> <tr> <td>Q</td> <td>blue</td> <td>blue ;</td> </tr> <tr> <td>R</td> <td>blue</td> <td>lilac ;</td> </tr> </tbody> </table>	food supplement	colour at start	colour at end	P	blue	lilac	Q	blue	blue ;	R	blue	lilac ;	[1]	rows P and R correct – 1 mark row Q correct – 1 mark
food supplement	colour at start	colour at end													
P	blue	lilac													
Q	blue	blue ;													
R	blue	lilac ;													
(b)	<table border="1"> <thead> <tr> <th>food supplement</th> <th>number of drops of iodine solution added</th> <th>vitamin C content</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>12</td> <td>high</td> </tr> <tr> <td>Q</td> <td>1</td> <td>none</td> </tr> <tr> <td>R</td> <td>5 ;</td> <td>high ;</td> </tr> </tbody> </table>	food supplement	number of drops of iodine solution added	vitamin C content	P	12	high	Q	1	none	R	5 ;	high ;	[2]	mark each column
food supplement	number of drops of iodine solution added	vitamin C content													
P	12	high													
Q	1	none													
R	5 ;	high ;													
(c) (i)	Benedict's (solution / reagent) ;	[1]													
(ii)	idea of eye protection / safety when using heat qualified ;	[1]													

Page 4	Mark Scheme	Syllabus	Paper
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Question	Mark scheme	Mark	Guidance								
(d)	<table border="1"> <tr> <td>test-tube</td> <td>time for brick red colour to appear/s</td> </tr> <tr> <td>P2</td> <td>75;</td> </tr> <tr> <td>Q2</td> <td>more than 180</td> </tr> <tr> <td>R2</td> <td>25;</td> </tr> </table>	test-tube	time for brick red colour to appear/s	P2	75;	Q2	more than 180	R2	25;	[2]	P2 = 1mark <u>both</u> Q2 and R2 = 1mark
test-tube	time for brick red colour to appear/s										
P2	75;										
Q2	more than 180										
R2	25;										
(e) (i)	volume of food supplement may not be the same ;	[1]									
(ii)	syringe / burette / <u>graduated</u> pipette / measuring cylinder / balance / scales ;	[1]									
(f)	<table border="1"> <thead> <tr> <th><i>Source of error</i></th> <th><i>Improvement</i></th> </tr> </thead> <tbody> <tr> <td>idea of difficult to be sure of end point / difficult to see when the colour changes ;</td> <td>white or black background / compare with standard / control / use a colorimeter;</td> </tr> <tr> <td>cannot add tubes to hot water / monitor colour change, in three tubes simultaneously ;</td> <td>do tubes separately / other people to do other tubes ;</td> </tr> </tbody> </table>	<i>Source of error</i>	<i>Improvement</i>	idea of difficult to be sure of end point / difficult to see when the colour changes ;	white or black background / compare with standard / control / use a colorimeter;	cannot add tubes to hot water / monitor colour change, in three tubes simultaneously ;	do tubes separately / other people to do other tubes ;	[max 2]	one error and one matching improvement I reference to repetition		
<i>Source of error</i>	<i>Improvement</i>										
idea of difficult to be sure of end point / difficult to see when the colour changes ;	white or black background / compare with standard / control / use a colorimeter;										
cannot add tubes to hot water / monitor colour change, in three tubes simultaneously ;	do tubes separately / other people to do other tubes ;										

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Question	Mark scheme	Mark	Guidance
(g) (i)	<p>A – axes labels with units ;</p> <p>S – even <u>scale</u> and plots to fill at least $\frac{1}{2}$ of grid both directions ;</p> <p>P – plots accurate to $\pm \frac{1}{2}$ square ;</p> <p>B – bars of equal width, not touching and with equal space between them ;</p>	[4]	<p>y axis – protein (content of food) g per 100 g</p> <p>x axis – names of foods labelled under each block , or identified with a key</p>
(ii)	177 ;;	[2]	$(20 \div 11.3) \times 100$
		[Total: 19]	

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Question	Mark scheme	Mark	Guidance
2 (a)	measure distance moved by air/water/meniscus ; for a set period of time ;	[2]	
(b)	fan / hairdryer ;	[1]	
(c)	<i>any 2 from:</i> leaf area / size ; type/species of plant / use same leaves; light (intensity) ; temperature ; diameter of capillary tubing ; no <u>additional</u> air movement, e.g. windows open ; humidity ;	[max 2]	

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Question	Mark scheme	Mark	Guidance
(d)	to prevent water leakage / AW ; to stop air getting in ;	[max 1]	e.g. water getting out , water loss
(e)	correct reading from the graph (2.3 and 0.8) ; 2.3 / 0.8 = 3 ;	[2]	
(f)	idea that it actually measures water uptake (not loss);	[1]	
(g)	drawing showing apparatus set up ; description of the treatments ; <i>any 4 of:</i> 1 use of a <u>control</u> with a correct example, 2 weigh (mass of) leaves at beginning with petroleum jelly applied; 3 weigh leaf at end ; 4 for a set period of time ; 5 describe a controlled variable / named environmental factor being kept constant ; 6 repeat experiment / described e.g. two leaves with same treatment ;	2 + 4 [max 6]	<i>allow any of the points shown as annotations on the diagram</i> e.g. wind (speed) / temperature / light (intensity) / humidity

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Question	Mark scheme	Mark	Guidance
(h) (i)	O – all lines single, clear and unbroken with no shading ; S – drawing occupies at least half the space ; D1 – no cells and only the sector drawn ; D2 – detail ;	[4]	
(ii)	108 ± 1 mm ;	[1]	
(iii)	(x)14 ;	[1]	A 15 if (ii) 109 mm ecf for incorrect measurement in (h) (ii) R if units included with the magnification
		[Total: 21]	