Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **May/June 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.

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Mark schemes will use these abbreviations:

;	separates marking points
/	alternatives
()	contents of brackets are not required but should be implied
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
Ig	ignore (for incorrect but irrelevant responses)
AW	alternative wording (where responses vary more than usual)
AVP	alternative valid point (where a greater than usual variety of responses is expected)
ORA	or reverse argument
underline	actual word underlined must be used by candidate
+	statements on both sides of the + are needed for that mark

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Question	Answer	Marks	Guidance
1(a)(i)	axes correct orientation and both axes labelled fully ; linear scale for both axes ; all 5 points visibly plotted correctly ; plotted points joined with ruled lines and no extrapolation ;	**4**	
1(a)(ii)	activity / volume of oxygen produced increases as pH increases ; reaches a peak / **AW** at pH7 ; then decreases ;	**3**	**A** neutral for pH7
1(a)(iii)	concentration of hydrogen peroxide ; volume of hydrogen peroxide ; mass of tissue ; surface area of tissue ;	**2**	

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Question	Answer	Marks	Guidance
1(a)(iv)	use same volume / concentration of hydrogen peroxide each time **;** idea of using same type / volume / mass / surface area of enzyme / tissue **;** fresh samples used (at each temperature) **;** different temperatures **;** range of suitable temperatures stated **;** method of maintaining temperature **;** leave time for flask and contents to come to temperature before measuring begins **;** measure volume of oxygen produced in (same) given time **;**	**5**	**A** water bath, **R** direct heating
1(a)(v)	stated safety precaution **;** explanation **;**	**2**	explanation must be linked to safety precaution
1(b)(i)	60 (°C) **;**	**1**	
1(b)(ii)	breaks down protein (stains) **;** named protein stain e.g. blood / food / milk **;** not denatured / deactivated by hot water / **AW** **;**	**2**	
	Total:	**19**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(a)</td><td>drawing 35–45 mm diameter ;

overall shape and proportions ;

nucleus correct shape ;

clear, continuous, smooth (rather than sketchy outline) of cell with no shading, stippling or cross-hatching ;</td><td>4</td><td></td></tr>
<tr><td>2(b)(i)</td><td>P: red blood cell / erythrocyte ;

Q: white blood cell ;</td><td>2</td><td>A named type of white blood cell</td></tr>
<tr><td>2(b)(ii)</td><td>cell Q has:

nucleus present ;

granular cytoplasm ;

larger (than cell P) ;</td><td>1</td><td></td></tr>
<tr><td>2(c)</td><td><table><tr><th>feature</th><th>cell Q</th><th>plant cell</th></tr><tr><td>cell wall</td><td>absent</td><td>present ;</td></tr><tr><td>nucleus</td><td>lobed AW</td><td>round / circular ;</td></tr></table></td><td>2</td><td>award one mark for each correct row</td></tr>
<tr><td></td><td>Total:</td><td>9</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
3(a)(i)	width = 22 ; mm ;	**2**	**A** ± 1 mm **A** 2.2 cm
3(a)(ii)	44 (mm) ; ;	**2**	**A** 42–46 consistent with (a)(i) correct answer, with no working shown, gains both marks
3(b)(i)	mean width of leaves from shady position = 46.2 (mm) ; mean width of leaves from sunny position = 32.7 (mm) ;	**2**	
3(b)(ii)	leaves from a shady position have a higher mean width ; leaves from a sunny position have more variable widths ;	**2**	
3(b)(iii)	take more leaves / use larger sample ;	**1**	**Ig** calculate average / mean
3(c)	leaves from shady place have a larger surface / area ; to trap more / available light ; for photosynthesis ; **OR** leaves from sunny position have smaller surface / area ; lose less water ; due to transpiration ;	**3**	 **A** less evaporation
	Total:	**12**	

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