

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2015 series****0610 BIOLOGY****0610/52**

Paper 5 (Practical Test), maximum raw mark 40

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### Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- **R** reject
- **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** 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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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Additional Guidance</b>
<b>1 (a)</b>	appropriate number of rows and columns ; headings correct (time and temperature ) ; both units correct (s and °C) ; 3 different temperatures recorded ; time recorded for each temperature ; results as expected (hottest first) ;	[6]	
<b>(b) (i)</b>	to make the results more reliable / to find anomalies / AW ;	[1]	<b>ignore</b> to reduce / avoid errors / accuracy <b>A</b> to find average / mean
<b>(ii)</b>	(rate of respiration ) increases as the temperature increases;	[1]	

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<b>(c) (i)</b>	(all the temperatures timed together, so) it is difficult to watch them at same time / AW ;  difficult to judge colour or end point (to know when to stop timing) ;	max [1]	
<b>(ii)</b>	put the test-tubes in one at a time / measure separately / stagger the time AW ;  use white card or colorimeter AW to see colour change more clearly;  repeats ;	max [1]	answer needs to be consistent with (c)(i)
<b>(iii)</b>	yeast foaming out of the test-tube / volume loss / difficult to measure volume accurately / yeast activity is variable ;	[1]	

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(d) (i)	$(54 \div 30) = 1.8$ ;	[1]	
(ii)	axes labelled and scaled evenly x axis – pH and y axis – rate of CO <sub>2</sub> production / cm <sup>3</sup> per min ;  size ;  all points plotted accurately to $\pm\frac{1}{2}$ small square ;  line drawn ;	[4]	
(iii)	<i>description:</i> as the pH increases the volume / rate increases <b>ora</b> ;  credit use of calculated data ;  <i>explanation:</i> reference to <b>enzymes</b> linked to pH ;	[3]	<b>A</b> any rate / volume doubles between pH4 and pH5 / or rate / volume trebles between pH5 and pH6.  <b>A</b> increased pH increases <b>enzyme</b> activity;
		[Total: 19]	

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2 (a) (i)	<p>drawing of outer edge uses single clear unbroken lines ;</p> <p>drawing occupies at least half of the space provided ;</p> <p>detail ;</p>	[3]	e.g. four or more distinct compartments / sections
(ii)	<p>length <b>XY</b> on photomicrograph is 58 (mm) ;</p> <p>line drawn on drawing and measurement recorded <math>\pm 1</math> mm ;</p> <p>correct units recorded for at least one measurement ;</p> <p><i>formula:</i> <math>\frac{\text{length of } \mathbf{XY} \text{ on drawing}}{\text{length of } \mathbf{XY} \text{ on photomicrograph}} ;</math></p> <p>correct magnification ;</p>	[5]	

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<b>(b) (i)</b>	<i>any two differences:</i>			
	feature	pollen grain <b>R</b>	pollen grain <b>S</b>	
	shape	round / spherical / AW	lobed / triangular / oval / elongated / bean shaped / AW ;	
	surface	spikey / hooked / rough / pointed	smooth / wrinkled ;	
	Number of visible parts/ areas/ AW	entire / one part	more than one visible part / AW ;	[2]
<b>(ii)</b>	spikes / hooks AW (on the outside surface) ;		[1]	

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(c) (i)	idea of a graticule / ruler in the eyepiece / microscopic ruler ;	[1]	.
(ii)	<p><i>any three from:</i></p> <p>during first 6 / up to 8 minutes pollen tube <b>R</b> grows faster / more than pollen tube <b>S</b>;</p> <p>after 6 / 8 minutes pollen tube <b>S</b> grows faster / more than pollen tube <b>R</b>;</p> <p>after / at 20 minutes / at end pollen tube <b>S</b> is longer than pollen tube <b>R</b>;</p> <p>use of calculated figures to compare <b>S</b> and <b>R</b>;</p>	max [3]	<p><b>A</b> comparative statements</p> <p><b>ignore</b> figures quoted directly from table.</p> <p><b>N.B.</b> pollen tube <b>S</b> is 11.3<math>\mu</math>m longer than pollen tube <b>R</b> after <b>20</b> minutes = 2</p>



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<b>(d) (i)</b>	<p><i>sampling</i> – picking fruits at different levels on the same plant/ different plants of same species; different levels of fruit on plant/ different locations / random numbering of samples e.g. choosing numbers from table/ pick fruits from a bag / AVP;</p> <p><i>counting seeds</i> – inside container/ water/ collect fruits before they split open/ discard fruits that have already split/ cut seeds from each fruit ; method e.g. tally chart, click counter, repeating/ count more than once ;</p>		<b>need to give the idea that individual fruits are counted separately</b>
		max [3]	
<b>(ii)</b>	<u>23</u> ;	[1]	
<b>(iii)</b>	<u>24</u> ;	[1]	
<b>(iv)</b>	<p>(idea that) pollen does not grow long enough (to reach ovules) / pollen not reaching stigma/ lack of pollinators AW /</p> <p>less ovules (fertilised or un-fertilised) ovules do not develop/ less fertilisation / AW /</p> <p>named environmental factors e.g. not enough water/ cold or frost/ minerals/ disease AW ;</p>	[1]	<b>ignore</b> mutation / genes / genetic makeup
		<b>[Total: 21]</b>	