

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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Question	Answer	Mark	Additional Guidance
1 (a)	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) (i)	to make the results more reliable/ to find anomalies/ AW ;	[1]	ignore to reduce / avoid errors / accuracy A to find average / mean
(ii)	(rate of respiration) increases as the temperature increases;	[1]	

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(c) (i)	(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]	
(ii)	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)
(iii)	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)	$(54 \div 30) = \underline{1.8}$;	[1]	
(ii)	axes labelled and scaled evenly x axis – pH and y axis – rate of CO₂ production / cm³ 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 ora ; credit use of calculated data ; <i>explanation:</i> reference to enzymes linked to pH ;	[3]	A any rate / volume doubles between pH4 and pH5 / or rate / volume trebles between pH5 and pH6. A increased pH increases enzyme activity;
		[Total: 19]	

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

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(b) (i)	<i>any two differences:</i>				
	feature	pollen grain R	pollen grain S		
	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]	
(ii)	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)	<i>any three from:</i> during first 6 / up to 8 minutes pollen tube R grows faster / more than pollen tube S; after 6 / 8 minutes pollen tube S grows faster / more than pollen tube R; after / at 20 minutes / at end pollen tube S is longer than pollen tube R; use of calculated figures to compare S and R;	max [3]	A comparative statements ignore figures quoted directly from table. N.B. pollen tube S is 11.3µm longer than pollen tube R after 20 minutes = 2

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(d) (i)	<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; <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 ;	max [3]	need to give the idea that individual fruits are counted separately
(ii)	<u>23</u> ;	[1]	
(iii)	<u>24</u> ;	[1]	
(iv)	(idea that) pollen does not grow long enough (to reach ovules) / pollen not reaching stigma/ lack of pollinators AW/ less ovules (fertilised or un-fertilised) ovules do not develop/ less fertilisation/ AW / named environmental factors e.g. not enough water/ cold or frost/ minerals/ disease AW ;	[1]	ignore mutation/ genes/ genetic makeup
		[Total: 21]	