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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 ÷ 30) = <u>1.8</u> ;	[1]	
(ii)	axes labelled and scaled evenly *x axis* – pH and *y axis* – rate of CO_2 production / cm^3 per min ; size ; all points plotted accurately to ±½ small square ; line drawn ;	[4]	
(iii)	*description:* as the pH increases the volume / rate increases **ora** ; credit use of calculated data ; *explanation:* 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 ; *formula:* $\frac{\text{length of } \mathbf{XY} \text{ on drawing}}{\text{length of } \mathbf{XY} \text{ on photomicrograph}}$; correct magnification ;	[5]	

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(b) (i) *any two differences:*

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)	*any three from:* 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)	*sampling –* 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; *counting seeds –* 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)	23;	[1]	
(iii)	24;	[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]	

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