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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0610 BIOLOGY

0610/52 Paper 5 (Practical Test), maximum raw mark 40

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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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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)
- <u>underline</u> 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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	Mark scheme	Mark	Guidance
1 (a) (i)	table drawn with (ruled) lines and distinct columns or rows ; both headings correct: leaf size / piece / area **and** time ; correct units in column / row headings only ; times recorded in each row ;	[4]	example layout: leaf size / mm | time / s: (piece)1, (piece)2, (piece)3 10 × 10 | | | | 15 × 15 | | | |
(ii)	mean time 10 mm × 10 mm **and** mean time 15 mm × 15 mm ;	[1]	units must be included to award mark
(iii)	larger (leaf size) is faster / smaller (leaf size) is slower ;	[1]	

	Mark scheme	Mark	Guidance
(b) (i)	bubbles ; detailed description of bubbles / description of leaf movement ;	[2]	
(b) (ii)	oxygen is produced ; reference to action of catalase ; bubbles of (oxygen / gas / air) collect on the leaf and cause it to rise / AW ; (oxygen / gas) is less dense so leaf rises ;	max [2]	

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	Mark scheme	Mark	Guidance
(c)	*either*: quicker as there is more cut edge / more damaged cells **;** (so) has <u>more</u> catalase exposed to peroxide **;** (so) produces <u>more</u> oxygen **;** *or*: slower because leaf piece is heavier / AW **;** not enough gas / oxygen to lift extra mass **;**	max [2]	

	Mark scheme	Mark	Guidance
(d) (i)	amount / quantity / volume / concentration of hydrogen peroxide solution **;** type of leaf / species of leaf / same leaf **;** same distance moved by leaf / tubes marked at same height or at 40 mm **;** mass / size of metal wire **;**	max [1]	

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	Mark scheme	Mark	Guidance
(ii)	timing three tubes at same time ; measure each separately ; cutting the leaves accurately ; use a cutter of known size / cork borer of known diameter / cut around a template ; using different parts / thickness / age of the leaf ; cut leaves from same part / same thickness / same age ; measuring volume of peroxide with a drawn line / AW ; (instead) measure out exact volume using syringe / burette / pipette / measuring cylinder / AW ; metal wire may damage leaf / may react with hydrogen peroxide ; use wire that does not cause damage / is unreactive ; using the same hydrogen peroxide for both leaves / AW ; use fresh peroxide so concentration is the same ;	max [2]	*marking points in pairs: 1 mark for the error and 1 mark for the improvement*

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	Mark scheme	Mark	Guidance
(d) (iii)	idea of replacing the peroxide with water / leaf with paper / using a boiled leaf **;** reference to keeping the rest of the experiment unchanged / describe the same experimental conditions **;**	[2]	
(e) (i)	*axes* – labelled with units and suitable scale **;** *size* – occupies at least half the grid **;** *plot* – all points plotted accurately ± ½ square **;** *bars* – same width and same size gap between each bar **;**	[4]	

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	Mark scheme	Mark	Guidance
(ii)	*description:* leaf Z is the fastest / leaf W the slowest / AW **;** sequence is Z > X > Y > W **; ora** comparative use of data **;** *conclusion:* different species have different amounts / activity of catalase / enzyme **;** leaf Z has more / more active, catalase than any of the other leaves / AW **; ora** leaf Z (hairy so) traps more bubbles **;** leaf W has thicker veins / more vascular tissue, so heavier **;**	max [3]	*max 2 marks for description and max 2 marks for conclusion*
		Total [24]	

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	Mark scheme	Mark	Guidance
2 (a) (i)	allow any single value in the range 48–58 **;**	[1]	
(ii)	$\frac{18}{\text{value from (i)}} \times 100$ **;** 31 – 39 (%) **;**	[2]	allow ecf from 2(a)(i) answer must be to nearest whole number award 2 marks for correct answer with no working shown
(b)	cell B has no clear nucleus / nuclear membrane / nuclear envelope **; ora** cell B chromosomes / chromatids present / AW **; ora** cell B has no nucleolus (in the nucleus) **; ora**	max [2]	

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	Mark scheme	Mark	Guidance
(c) (i)	whole drawing uses single clear lines with no shading ; drawing occupies at least half of the space provided ; cell shape is approximately twice as long as wide **and** cell wall shown as separate layer around some of the cell ; individual chromosomes drawn as double lines resembling the arrangement in photograph ; label line to a chromosome ;	[5]	
(ii)	line drawn along length of Fig. 2.2 ; measurement recorded in mm ;	[2]	

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	Mark scheme	Mark	Guidance
(iii)	$\frac{\text{length measured from Fig. 2.2}}{800}$; correct answer ;	[2]	
(d)	X has layers of cells / Y has no layers / AW ; X has different types of cells / Y cells all look similar / AW ; Y cells are invading / spreading into X / AW ; cells in Y are breaking away from rest of cells on surface / cells in X remain within outer layer / AW ; cells in Y have large(er) nuclei / nucleus fills almost all the cell / cells in X have small(er) / various sizes of nuclei / AW ;	max [2]	
		Total [16]	

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