

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series**0610 BIOLOGY****0610/51**

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
- I ignore (mark as if this material was not present)
- A accept (a less than ideal answer which should be marked correct)
- AW alternative wording
- underline words underlined 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
- A, S, P, L Axes, Size, Plots and Line for graphs
- O, S, D, L Outline, Size, Detail and Label for drawings
- (n)ecf (no) error carried forward
- () 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)	<p>table drawn with (ruled) lines and cells;</p> <p>headings correct (time, volume and (syringe) 1, 2, 3);</p> <p>units correct in both headings;</p> <p>results recorded in table;;; (1 mark per column completed)</p>	6	<p>A any orientation, outer border not needed</p> <p>R units within the table</p> <table border="1"> <thead> <tr> <th rowspan="2">time / min</th> <th colspan="3">volume / cm³</th> </tr> <tr> <th>(syringe) 1</th> <th>(syringe) 2</th> <th>(syringe) 3</th> </tr> </thead> <tbody> <tr> <td>0</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	time / min	volume / cm ³			(syringe) 1	(syringe) 2	(syringe) 3	0				5				10				15				20			
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0																														
5																														
10																														
15																														
20																														
(b) (i)	to make the results more reliable / to find anomalies / to calculate an average;	1																												
(ii)	values in table at 20 min added correctly and divided by 3;	1	A ecf for incorrect addition of values used in the calculation																											
(c)	<p>independent variable:</p> <p>add different mass of sugar to mixture(s);</p> <p>idea of range of sugar masses;</p> <p>control variables: (max 2)</p> <p>same mass / 50 g of flour;</p>		<p>A amount / quantity for mass</p> <p>at least 3 different masses in 0 – 10 g range</p>																											

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	<p>same volume / 30 cm^3 of yeast suspension;</p> <p>keep at same temperature;</p> <p>take measurements for / after 20 min;</p> <p>dependent variable:</p> <p>measure / check the <u>volume of</u> dough;</p>	max 4	<p>A same volume of dough / add dough to the same level (in syringes)</p> <p>A leave for same time and measure</p>
(d) (i)	<p>30;</p> <p>$(35 - 5 = 30)$</p>	1	

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(ii)	<p>A – axes labelled and scaled evenly;</p> <p>S – size,</p> <p>P – all points plotted accurately $\pm\frac{1}{2}$ small square;</p> <table border="1" data-bbox="315 491 1200 616"> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> </tr> <tr> <td>1</td> <td>5</td> <td>15</td> <td>30</td> <td>42</td> <td>25</td> <td>2</td> </tr> </table> <p>L – line drawn;</p>	10	20	30	40	50	60	70	1	5	15	30	42	25	2	4	<p>x-axis: temperature / °C y-axis: average increase in volume / cm³ I orientation plots to fill half, or more than half, of grid along both axes</p> <p>P = 0 if no scale A ecf (d)(i) A ecf of correct plots on an uneven scale</p> <p>if plot average volume and not average increase in volume = max 3</p> <p>A either best fit or point to point, ruled lines or smooth curve R extrapolation > $\frac{1}{2}$ small square R histogram or bar chart</p>
10	20	30	40	50	60	70											
1	5	15	30	42	25	2											
(iii)	<p>as the temperature increases the (average) increase in volume increases to a peak/up to 50 °C;</p> <p>up to 50 °C the (average) increase in volume starts slowly, then increases;</p> <p>above 50 °C the (average increase in) volume slows / increases less / decreases;</p>	max 2	<p>A trend– as temperature increases, volume increases then decreases = max 1</p> <p>A non-linear / changes gradient</p> <p>R volume decreases A ecf for wrong optimum temperature</p>														
(iv)	<p>yeast activity increases with temperature up to 50 °C;</p> <p>optimum temperature is 50 °C;</p> <p>(some of) yeast is killed / enzymes become denatured above 50 °C;</p>	max 1	<p>A enzyme activity / metabolism / respiration</p> <p>I volume / growth of yeast</p> <p>R yeast is denatured / enzyme is killed</p>														
		[Total: 20]															

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2 (a) (i)	<p>drawing of leaf R (monocot):</p> <p>O – outline is single clear line (and no shading anywhere);</p> <p>S – drawing occupies at least half of the space provided;</p> <p>D – detail at least mid-rib and 3 veins each side;</p> <p>L – label on midrib;</p>	4	<p>wrong leaf drawn = max 3 (O, S and L)</p> <p>occupies at least half of the space provided / leaf longer than 50 mm</p> <p>R if drawing touches / extends into printed words</p> <p>minimum 7 lines, central line extends full length of leaf, other veins need not connect to base of midrib / petiole</p> <p>R ruled lines</p> <p>label lines must make contact with midrib</p>
(ii)	<p>measurement recorded for specimen on widest part of leaf;</p> <p>line drawn and measurement for widest part of leaf ± 1 mm;</p> <p>mm recorded for at least one measurement;</p>	3	<p>A measurement of leaf length for leaf R and drawing</p> <p>if cm used, allow measurements but no unit mark</p>
(iii)	<p>formula: $\frac{\text{widest part of drawing}}{\text{widest part of specimen}}$;</p> <p>calculation: magnification correct from their figures;</p>	2	<p>measurements should be same as in (a)(ii)</p> <p>A ecf for cm measurements</p> <p>A words or figures</p> <p>answer must be whole number</p>

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2 (b) (i)		R	S	A other differences from Supervisor's Report
	shape	narrow / thin / AW	oval / round / wide / AW;	
	venation	parallel / straight / AW	netted / branched / curved / AW;	
	leaf stalk	no petiole	petiole;	
	appearance	shiny / bright / light	dull / dark;	
	edge	smooth	irregular / toothed;	
			max 2	
(ii)	R is monocotyledon as has parallel veins / AW;		1	
(c) (i)	temperature; air currents / drafts; light (intensity); leaf surface area;		max 1	
(ii)	method of collecting liquid / water / water vapour; test for water: use (dry) cobalt chloride paper / test (liquid) boiling point / freezing point for water; result: cobalt chloride changes in colour from blue to pink / boiling point 100 °C / freezing point 0 °C;		3	A e.g. clip paper to leaf, collect water / liquid / water vapour in bag / tube / box A any other anhydrous salt

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(iii)	<p>similarities: (max 2)</p> <p>both leaves lose water / mass;</p> <p>both leaves lose more water at the start / water loss slows with time;</p> <p>actual loss as percentage of leaf mass is almost the same;</p> <p>differences: (max 2)</p> <p>leaf W loses more water than leaf V / ora;</p> <p>calculation of data;</p> <p>leaf V appears to have anomalous result (at 10 / 15 min) / leaf V increase in mass between 10 and 15 min / AW;</p> <p>mass leaf V stops losing mass / stays constant at 50 mins;</p>	<p>max 4</p>	<p>A W loses water at a faster rate than V.</p> <p>A 65% loss for V and 64% loss for W A leaf W loses 4.8g / leaf V loses 3.4g / W loses 1.4g more than V</p> <p>A At 15 min V increases by 1.5g</p>
		[Total: 20]	