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
- <u>underline</u> 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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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Additional Guidance</th></tr>
<tr><td>1 (a)</td><td>table drawn with (ruled) lines and cells;

headings correct (time, volume and (syringe) 1, 2, 3);

units correct in both headings;

results recorded in table;;;
(1 mark per column completed)</td><td>6</td><td>A any orientation, outer border not needed

R units within the table
<table>
<tr><th rowspan="2">time / min</th><th colspan="3">volume / cm^3</th></tr>
<tr><th>(syringe) 1</th><th>(syringe) 2</th><th>(syringe) 3</th></tr>
<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>
</table></td></tr>
<tr><td>(b) (i)</td><td>to make the results more reliable / to find anomalies / to calculate an average;</td><td>1</td><td></td></tr>
<tr><td>(ii)</td><td>values in table at 20 min added correctly and divided by 3;</td><td>1</td><td>A ecf for incorrect addition of values used in the calculation</td></tr>
<tr><td>(c)</td><td>independent variable:

add different mass of sugar to mixture(s);

idea of range of sugar masses;

control variables: (max 2)

same mass / 50 g of flour;</td><td></td><td>
A amount / quantity for mass

at least 3 different masses in 0 – 10 g range</td></tr>
</table>

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

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<table>
<tr><td>(ii)</td><td>A – axes labelled and scaled evenly;

S – size,

P – all points plotted accurately ±½ small square;

<table><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>
L – line drawn;</td><td>4</td><td>x-axis: temperature / °C
y-axis: average increase in volume / cm^3
I orientation
plots to fill half, or more than half, of grid along both axes

P = 0 if no scale
A ecf (d)(i)
A ecf of correct plots on an uneven scale

if plot average volume and not average increase in volume = max 3

A either best fit or point to point, ruled lines or smooth curve
R extrapolation > ½ small square
R histogram or bar chart</td></tr>
<tr><td>(iii)</td><td>as the temperature increases the (average) increase in volume increases to a peak / up to 50 °C;

up to 50 °C the (average) increase in volume starts slowly, then increases;

above 50 °C the (average increase in) volume slows / increases less / decreases;</td><td>max 2</td><td>A trend– as temperature increases, volume increases then decreases = max 1

A non-linear / changes gradient

R volume decreases
A ecf for wrong optimum temperature</td></tr>
<tr><td>(iv)</td><td>yeast activity increases with temperature up to 50 °C;

optimum temperature is 50 °C;

(some of) yeast is killed / enzymes become denatured above 50 °C;</td><td>max 1</td><td>A enzyme activity / metabolism / respiration

I volume / growth of yeast

R yeast is denatured / enzyme is killed</td></tr>
<tr><td></td><td></td><td>[Total: 20]</td><td></td></tr>
</table>

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

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<table>
<tr><td>2 (b) (i)</td><td>
<table>
<tr><th></th><th>R</th><th>S</th></tr>
<tr><td>shape</td><td>narrow / thin / AW</td><td>oval / round / wide / AW;</td></tr>
<tr><td>venation</td><td>parallel / straight / AW</td><td>netted / branched / curved / AW;</td></tr>
<tr><td>leaf stalk</td><td>no petiole</td><td>petiole;</td></tr>
<tr><td>appearance</td><td>shiny / bright / light</td><td>dull / dark;</td></tr>
<tr><td>edge</td><td>smooth</td><td>irregular / toothed;</td></tr>
</table>
</td><td>max 2</td><td>A other differences from Supervisor's Report</td></tr>
<tr><td>(ii)</td><td>R is monocotyledon as has parallel veins / AW;</td><td>1</td><td></td></tr>
<tr><td>(c) (i)</td><td>temperature;

air currents / drafts;

light (intensity);

leaf surface area;</td><td>max 1</td><td></td></tr>
<tr><td>(ii)</td><td>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;</td><td>3</td><td>A e.g. clip paper to leaf, collect water / liquid / water vapour in bag / tube / box

A any other anhydrous salt</td></tr>
</table>

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

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