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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

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

<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><td rowspan="2">time / min</td><td colspan="3">volume / cm^3</td></tr>
<tr><td>(syringe) 1</td><td>(syringe) 2</td><td>(syringe) 3</td></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>

	same volume / 30 cm^3 of yeast suspension; keep at same temperature; take measurements for / after 20 min; dependent variable: measure / check the <u>volume o</u>f 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**	

<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><i>x</i>-axis: temperature / °C
<i>y</i>-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>

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

<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>

(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]	