CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0610 BIOLOGY

0610/63 Paper 6 (Alternative to Practical), 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 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Mark schemes will use these abbreviations:

;	separates marking points
/	alternatives
R	reject
A	accept (for answers correctly cued by the question)
I	ignore as irrelevant
ecf	error carried forward
AW	alternative wording (where responses vary more than usual)
AVP	alternative valid point
underline	actual word given must be used by candidate (grammatical variants excepted)
( )	the word / phrase in brackets is not required but sets the context
D, L, T, Q	quality of: drawing / labelling / table / detail as indicated
max	indicates the maximum number of marks

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Question	Answer	Marks	Guidance for Examiners
1 (a) (i)	drawing: **O** – outline; **S** – size; **D** – detail; **L** – label; one label from: seed(s) / (remains of) stigma or style / stem or stalk or pedicel / succulent part or flesh or cortex	[4]	clear, unbroken lines with no shading larger than original label line must end on structure, even if unambiguous
(ii)	length of X – X of Fig.1.1; equivalent length X – X of drawing; formula; length X – X on drawing ÷ length X – X on Fig.1.1. answer;	[4]	**A**. 87–90 mm mark is independent of other marking points
(b) (i)	skin / seed(s) / stalk or stem / both have flesh AW / smooth surface / skin;	[1]	

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<table>
<tr><td>(ii)</td><td>
<table>
<tr><td>difference</td><td>apple</td><td>plum</td></tr>
<tr><td>stem</td><td>un-branched
straight
smooth
AW</td><td>branched;
crooked;
uneven surface;
AW</td></tr>
<tr><td>seeds</td><td>darker
2 visible / 1+
at two sides
smaller
AW</td><td>lighter
one;
central;
larger;
AW</td></tr>
<tr><td>fleshy part</td><td>thick(er)
light / white</td><td>thin(er);
dark;</td></tr>
<tr><td>size of whole fruit</td><td>larger / larger SA
unequal halves
basal indentation</td><td>smaller/smaller SA;
symmetrical;
absent;</td></tr>
</table>
</td><td>[max. 3]</td><td>any three differences in one box or row could gain 3 marks, but inconsistencies negate

features must be visible, not inferred

no mark for naming the feature, but must be clearly stated</td></tr>
<tr><td>(c)</td><td>safety feature;

Benedict’s solution;

heat / boil / 70 °C+ cited;

colour change blue / turquoise to green / yellow / orange / red ;</td><td>[4]</td><td>A fehling’s / copper sulphate + sodium hydroxide or potassium hydroxide
A clinistix

I warm

initial colour must be given</td></tr>
<tr><td></td><td></td><td>[Total: 16]</td><td></td></tr>
</table>

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<table>
<tr><td>2 (a)</td><td>

A – axes label + even scale;

S – size;

P – plot:

<table>
<tr><td></td><td colspan="2">time / s</td></tr>
<tr><td>pH</td><td>40 °C</td><td>50 °C</td></tr>
<tr><td>5.5</td><td>600</td><td>850</td></tr>
<tr><td>6.0</td><td>360</td><td>500</td></tr>
<tr><td>7.0</td><td>50</td><td>70</td></tr>
<tr><td>7.5</td><td>35</td><td>65</td></tr>
<tr><td>8.0</td><td>45</td><td>100</td></tr>
</table>

L – line;

K – key;

</td><td>[5]</td><td>spacing of numerical values used in plots to fill half the grid or more in both directions

ruler drawn point to point / smooth curve</td></tr>
<tr><td>(b) (i)</td><td>

describe:
increased rate / decreased time as pH increases (5.5–7.5);

pH 7.5 identified as optimum / most rapid / least time taken;

decreased rate / increased time as pH increases (7.5 to 8.0);

explain:
(enzyme activity changes because) enzyme is denatured / shape of active site is altered AW;

</td><td>[4]</td><td></td></tr>
</table>

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(ii)	*describe:* takes more time / slower at 50˚C / ORA for 40^0C; difference more marked at pH 5.5 and pH 8.0 AW; similar shape to curves / AW; data comparison;	[max. 2]	
(c) (i)	to come to same temperature / equilibrate;	[1]	
(ii)	mark 'X' or similar mark on underside / waterproof mark / AW; hold against dark background / AW comparison with distilled water and undigested milk or with end point / AW; shine a light through / use of a meter;	[max. 1]	
(d) (i)	at least three other temperatures in addition to 40°C + 50°C;	[1]	
(ii)	pH; trypsin: conc; volume / amount; type; milk: conc; volume / amount; substrate;	max [2]	any three from any line
(iii)	time to clear / AW;	[1]	
(iv)	water / boiled enzyme / inactive enzyme;	[1]	
		[Total: 18]	

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3 (a)	*carbon dioxide* – 0.04% / lower <u>and</u> 4.0% / higher; *water* – varies due to humidity of surroundings / AW <u>and</u> more / saturated;	[2]	
(b) (i)	*test* – limewater ; *results* – clear / colourless / transparent to cloudy;	[2]	**A**. hydrogen carbonate solution – red to yellow. initial colour must be given
(ii)	*test* – (anhydrous) copper sulphate / cobalt chloride; *results* – white to blue for copper sulphate blue to pink for cobalt chloride;	[2]	
		[Total: 6]	

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