UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0610 BIOLOGY

0610/61 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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

UNIVERSITY of CAMBRIDGE
International Examinations

<table>
<tr><th>Question</th><th>Mark scheme</th><th>Mark allocation</th><th>Guidance</th></tr>
<tr><td>1 (a) (i)</td><td>
<table>
<tr><td rowspan="2">Mass of tissue g</td><td colspan="2">Volume of oxygen cm^3 per 4 minutes</td></tr>
<tr><td>Sweet potato</td><td>Irish potato</td></tr>
<tr><td>2.0</td><td>32.0</td><td>12.5</td></tr>
<tr><td>2.0</td><td>20.0</td><td>9.0</td></tr>
<tr><td>2.0</td><td>35.5</td><td>8.5</td></tr>
<tr><td>2.0</td><td>28.0</td><td>10.0</td></tr>
<tr><td>total</td><td>115.5</td><td>40.0 ;</td></tr>
<tr><td>mean</td><td>28.875</td><td>10.0 ;</td></tr>
</table>
</td><td>[2]</td><td></td></tr>
<tr><td>(ii)</td><td>Larger surface or area / to release more enzyme / faster reaction;</td><td>[1]</td><td>Accept enough surface area to react
Ignore to make the tissues more uniform in texture / easier to measure / reference to skin of potato
Accept more contact
Ignore easier reaction</td></tr>
</table>

Question	Mark scheme	Mark allocation	Guidance
(b) (i)	Simple column graph to show the range of readings for the sweet potato. **A –** labelled axes with units**;** **S –** scale**;** **P –** accurate plot of columns, ±½ square**;** **B –** neat bars of equal width, not touching and equal interspaces**;** **M –** mean line shown ± ½ square**;**	**[5]**	 **A – accept** experiment and volume gas or O_2 / cm^3 – numbers should be placed centrally under columns **S –** scale on *y* axis must be even and bars plotted to fill half or greater than half of grid on both axes. **Ignore** orientation of bars **P – deduct** mark if any incorrect **Accept** line columns Mean line does not need to be labelled If line graph allow **A, P** and **M** only **max 3** If results for Irish potato allow **A, B** and **M** only
(ii)	**two from:** reference to temperature**;** different tubers / part of tuber / amounts catalase**;** reference to pH**;** difference in surface area**;** gas or oxygen escaping or difficulties in accurate measurement of gas volume / AW**;**	**[2]**	**Ignore** 'conditions were not the same' unless qualified **Ignore** references to activity / concentration of H_2O_2 **Accept** enzymes for catalase **Ignore** different amounts of potato **Accept** correct reference to size or no: pieces for surface area **Ignore** difficulties in reading measurements

Question	Mark scheme	Mark allocation	Guidance
(c)	**Two from:** **S:** use of water bath / AW; **E:** correct reference to maintaining temperature / AW; **S:** use of stopwatch / data logger / computerised or monitoring system / AW; **E:** correct reference to accurate timing / AW; **S:** use of stirring device / same agitation or shaking / AW; **E:** to avoid tissue settling on bottom of flask; **S:** use the same size / similar apparatus; **E:** different apparatus or sizes would affect result; **S:** use burette / syringe / pipette / AW; **E:** for accurate measurement of volume of hydrogen peroxide; **S:** cut even size potato pieces / grind potato / AW; **E:** to keep surface area the same / AW; **S:** add buffer / pH controller / acid or alkali / AW; **E:** to maintain constant pH / AW; **S:** use funnel through bung to add H_2O_2 / AW; **E:** to save removing bung / prevent gas escape; **S:** use same concentration H_2O_2; **E:** to control substrate / make the experiment the same; **S:** repeat **more** times; **E:** to reduce anomalies / AW; AVP;	**[max 4]** **[Total:14]**	***Mark in couplets – improvement with appropriate explanation*** If not in couplets, **max 2** for **S** or **E** answers only **Ignore** more frequent / longer timings **Accept** maximising surface area for 'grinding' potato **Accept** reduce mistakes **Ignore** use of different tissues / plants

Question	Mark scheme	Mark allocation	Guidance
2 (a) (i)	**Drawing**: **S:** size greater than original; **O:** outline shape to show proportions of feather A; **D:** one correct detail; **Label**: one from rachis / calamus / after feathers / vane / shaft / quill / umbilicus / barb;	[4]	**Award max 3 for drawing and max 1 for labels** If feather B drawn, accept **S** [> 82 mm] only for drawing and accept correct label, max 2 **Accept** evidence of smooth surface top left / middle region / smoother base / two projections lower right / rachis **Accept** attachment to body / filaments
(ii)	insulation / trap (body) warmth / prevents loss of (body) warmth / traps air / protection against cold / AVP;	[1]	**Ignore** warm / heat the bird **Ignore** protect alone **Ignore** camouflage / attraction / breeding / cover
(iii)	flight; blade like / rigid / stiff / wind or air resistance / air will not pass through / aerodynamic / AW;	[2]	**Accept** glide **Ignore** feathers packed together **Ignore** increase surface area Less wind / air resistance loses second marking point.
(b) (i)	correct area / 12.5 cm^2 (± 1 cm^2); evidence that 1 square = 1 cm^2; marks on feather or grid to show it was used to calculate the area of feather; reference to number of whole and part squares in the working; double calculated area to give total surface area;	[max 3]	**Accept** 25 cm^2 (± 1 cm^2) if they have doubled the area **Accept** statement or correct use in calculation or on grid

Question	Mark scheme	Mark allocation	Guidance
(ii)	Divide feather into (geometric) shapes; measure and add together areas of each shape; **OR** Cut out shape of feather in paper and weigh mass; cut out known area of paper and weigh mass; calculate area of paper; **OR** Cut feather into small pieces; fit into 1 cm^2 squares; **OR** Use grid with smaller squares; count squares covered by feather / AW; Double calculated area to give total surface area;	**[max 2]** **[Total: 12]**	**Ignore** smaller grid unqualified This mark can be awarded with any other mark
3 (a) (i)	**D** (shoot / seedling) curves / bends / grows to one side; light from one / left side; unequal growth / more extension or growth of dark side / phototropism;	**[3]**	**Ignore** shorter because F is shorter **Ignore** reference to roots, D and E are the same grows / bends / curves to the side where light is coming from = 2 **Accept** reference to auxin / hormone
(ii)	**E** tall(er) (shoot / seedling); uniform light / light above stem / no light at all; competition for light / AW;	**[3]**	**Ignore** reference to roots, D and E are the same **Accept** big / long / grew a lot **Ignore** direct / plenty / large amounts of light / under the sky **Accept** etiolation / auxin not destroyed or equally distributed or produced

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<tr><td>(iii)</td><td>F (shoot / seedling) small(er) / AW;

Slow(er) / reduced growth / less well developed;

(grown in) colder or lower temperatures / diseased / lacks minerals / AVP;</td><td>[3]</td><td>Accept short(er) roots

Accept no growth / undeveloped
Ignore lack of water
Accept extreme temperatures
Ignore hot temperatures
Ignore photosynthesis
Accept nutrients / fertilisers</td></tr>
<tr><td>(b) (i)</td><td>two from
seeds / remains of stigma or style or pointed (tip) / stalk / seed attachment or seeds arranged at either side / seeds inside the fruit;;</td><td>[max 2]</td><td>Read through entire answer and award any correct points.
e.g. 'Seeds at either side' = 2
Accept number / shape / type of seed for 'seeds'
Accept (fruit) is smooth</td></tr>
<tr><td>(ii)</td><td>Two rows from
<table><tr><th>Fruit G</th><th>Fruit H</th></tr><tr><td>Short(er) / rounded</td><td>Long(er) / narrow;</td></tr><tr><td>Less seeds / 6 seeds</td><td>more seeds / 13 seeds;</td></tr><tr><td>Seeds apart</td><td>seeds close together;</td></tr></table></td><td>[2]</td><td>Accept comparative answers on one side of the table

Accept more fruit mass (grey area) versus less fruit mass
Ignore seeds in a ring / AW</td></tr>
<tr><td>(c)</td><td>bursts open / explosive / eaten / water / dries out / animals / wind / AW;</td><td>[1]

[Total: 14]</td><td>Ignore seeds dispersed when fruit dies / rots</td></tr>
</table>