UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0610 BIOLOGY

0610/61 Paper 61 (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.

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UNIVERSITY of CAMBRIDGE
International Examinations

General notes

Symbols used in mark scheme and guidance notes.

/ separates alternatives for a marking point

; separates points for the award of a mark

A accept – as a correct response

R reject – this is marked with a cross and any following correct statements do not gain any marks

I ignore/irrelevant/inadequate – this response gains no mark, but any following correct answers can gain marks.

( ) the word/phrase in brackets is not required to gain marks but sets context of response for credit. e.g. (waxy) cuticle. Waxy not needed but if it was described as a cellulose cuticle then no mark.

Small underlined words – this word only/must be spelled correctly

ORA or reverse argument/answer

ref./refs. answer makes appropriate reference to

AVP additional valid point (e.g. in comments)

AW alternative words of equivalent meaning

ecf error carried forward

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<table>
<tr><th>Question</th><th>Expected Answers</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1 (a) (i)</td><td>Drawing: O quality mark – clear complete lines, shape and larger than photograph, no shading;
L more than 1 layer of wall recognised;
D asymmetric right side / inside layer folded – detail;

Any two labels if correct:
lumen / space / hole;
muscles;
thick(er) wall / AW;
elastic (wall / fibres);
connective tissue (outer layer);
<u>folded</u> inner layer / endothelium / lining;</td><td>[5]</td><td>Score the drawing by a vertical row of ticks or crosses in order O, L and D shown to the uncluttered side of the drawing.
A. if circles are incomplete to show more than one layer.
If drawn only the vein, Y – award O only. Accept lumen label.
If a compass or equivalent has used – do not award O mark.
Look for 'bulge' in wall of blood vessel not the 'floating' bit in the middle.

Lumen = AW e.g. 'room for blood' I. blood alone.
A. correct terms referring to tunica adventitia = outer layer; tunica media = muscle + elastic tissue; tunica intima = endothelium.
I. reference to 'smooth' 'longitudinal' 'stretching layer. 'radial'. R. striated / cardiac.
I. cytoplasm / cell wall / cell membrane / nucleus.
If inner layer or wall, must have <u>folded</u>. Endothelium alone = 1 mark.
If both blood vessels are drawn, mark the artery only.
Longitudinal views – mark the end section only.</td></tr>
<tr><td>(ii)</td><td>X – <u>artery</u>;</td><td>[1]</td><td>A. arteries. or arteriole or specific named artery. Mark in list order. R. vein.</td></tr>
<tr><td>(iii)</td><td><table>
<tr><td>feature</td><td>X – artery</td><td>Y – vein</td></tr>
<tr><td>shape in section</td><td>round</td><td>oval</td></tr>
<tr><td>wall thickness</td><td>thick</td><td>thin</td></tr>
<tr><td>lining</td><td>folded / AW</td><td>smooth / AW</td></tr>
<tr><td>tissue</td><td>(more) muscle / elastic</td><td>less</td></tr>
<tr><td>lumen size</td><td>small / AW</td><td>large / AW</td></tr>
</table></td><td>[max 2]</td><td>'thick muscular wall' = 2

marks from either side depending on approach. Not comparative.

If capillary points are made… ignore – question is to distinguish between X and Y.</td></tr>
</table>

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(b) (i)	14, 15, 16, 17, 17, and 18 in table	[1]	all numbers correct in table.
(ii)	**A**xes – orientations and labels; **S**cales – linear scale, to fill more than half the printed grid; **P**lot – all correct; **L**ine – joined point to point with ruled lines;	[4]	(**X** – mass of weight g and **Y** – increase in mm) +/- half a small square. ecf – from table. All plotted points (11) to be included on the graph. If plot internal diameter (2nd column) allow: **A** and **L** – Max 2. **A.** smooth curve passing through most points. **R.** extrapolation of line beyond 100g. **R.** thick lines. Straight line, non linear scale allow **A** only if correct. Score the drawing by a vertical row of ticks or crosses in order **A**, **S**, **P** and **L**. Histogram – **A**, **P** only.
(iii)	original size, shape or position / decrease / contract; (*reason*) elasticity must be linked to return in size / recoil; thick wall / elastic tissue / AW; AVP e.g. ref blood pressure / pulsation ;	[max 3]	**I.** expansion / damaged / overstretched. **I.** reference to elastic limit and to overstretching.
		[Total: 16]	

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<table>
<tr>
<td>2 (a) (i)</td>
<td>One visible from;
Skin / peel / outer wall / shell;
outer layer darker than inside;
side buds / spots / 'eyes' present;
inner tissue – similar colour;</td>
<td>[1]</td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>
<table>
<tr><th>feature</th><th>sweet potato</th><th>irish potato</th></tr>
<tr><td>inner tissue</td><td>spotted / speckled</td><td>no spots, uniform;</td></tr>
<tr><td>skin / peel / wall</td><td>darker
thicker</td><td>lighter;
thinner;</td></tr>
<tr><td>shape of ends</td><td>pointed / slanted (both ends)</td><td>rounded (both ends) ;</td></tr>
<tr><td>overall shape</td><td>long / narrow</td><td>short / round / more circular / oval;</td></tr>
<tr><td>margin</td><td>two layers visible not smooth / uneven</td><td>one layer; smooth;</td></tr>
<tr><td>section shape</td><td>circular /rounded smaller</td><td>oval; larger;</td></tr>
<tr><td>stalk / root *</td><td>absent</td><td>present;</td></tr>
</table>
</td>
<td>[max 2]</td>
<td>I. differences in composition – starch / storage.

Any two differences.
Comments should match and accept one difference per printed row on the question paper.
Both spaces on mark scheme for 2 differences can refer to the same feature e.g. skin or margin.

Look for comparative terms … '-er'.

* scar or hairs at the base.</td>
</tr>
</table>

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(b)	1. *starch* equal sample size of each potato; ONCE iodine <u>solution</u> / iodine in KI / iodine reagent; same concentration / volume of iodine solution; expected colour change; (yellow / orange / red brown to blue / blue black / purple) compare colour change; (how fast / darker) (using colorimeters) *Safety* – **one** from: Tie back hair / tie; ONCE Safety goggles / spectacles; ONCE Lab coat; ONCE 2. equal samples – same volume of water / same preparation / grinding; ONCE Benedict's reagent; same volume / amount of Benedict's solution; heating; expected colour change; (blue → green / orange / red) compare colours; (intensity of colour – or timing of colour change) (use of colorimeters) *Safety* – **one** from: water bath; test-tube holders; same as above	[max 3] [max 5] [8 marks]	**A.** drops of iodine if stated number of drops but ignore vague references such as few or several. 'same volume of iodine solution' = 2. **I.** using ethanol. Need original and final colours for expected change. **A.** chemical components / Fehling's / Clinistix. (pink → dark blue) Not just warm but heat – maybe used a boiling water bath = 2 marks. Need original and final colours for expected change. **I.** repeats. If describe biuret ignore description of test but allow safety point.
		[Total: 11]	

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3 (a) (i)	dish **A** – 19/20, dish **B** – 2/20, and dish **C** 9/10;;	[2]	**A.** numbers 19, 2 and 9 only. Mark wherever these figures occur e.g. on dish. 1 mistake – 1 mark / 2 mistakes – no marks.
(ii)	800%;; *possible working* 18 – 2 = 16 $\frac{16}{2} \times 100 = 800\%$	[2]	Correct answer = 2 marks. Credit alternative methods of working if answer is incorrect. Might round down dish **B** to 1 / 10. = 1 mark. Might round up dish **C** to 18 / 20. = 1 mark. 80% = 1 mark. If error in table – award one working mark if applicable.
(iii)	(dish **C** no tomato juice and dish **B** has therefore) there is another chemical in juice which stops the germination AW; same pH as dish **B** but higher % in **C** so not pH sensitive; correct reference to osmotic / turgor / concentration of tomato juice / contains less water / absorbs less water; stops seeds developing near parent plant / prevents competition / saves overcrowding / lack space; AVP e.g. alleopathy / bacteria in juice;	[max 2]	Dish **C** is referred to from the question by implication. **I.** dish **C** has more nutrients Chemicals – accept suitable named examples e.g. Vit. C.
(iv)	dish **A** – control; for comparison purposes / see difference; to show it was not pH 6 – weak acid solution;	[max 1]	Ignore fair test / efficiency. **A.** to test viability of seeds.

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(b)	1. same batch of seeds / same type / same maturity; 2. same volume of solution; 3. same environmental conditions of oxygen; 4. same environmental conditions of light / warmth; 5. same number of seeds for each test; 6. wash surface of seeds first to remove juice of fruit chemicals / bacteria / spores / AW; 7. suitable range of pH solutions / suggest 3 or more named pH / acid solutions; 8. how obtained such as use of buffers or named liquids e.g. vinegar.; 9. same period of time for soaking or germinating; 10. repeat whole procedure / two + dishes or use replicas at the same time; 11. plot graph;	[max 6]	**I.** mass. **I.** Same environment alone – too vague. **A.** Same temperature. Need more than one seed for pt 5. few / several – too vague. from low pH to high pH – 3 or more examples. (pt 7) e.g. strong and weak acid and weak alkali = 3 solutions. **I.** 'few' or 'several' days. (specified number of days not months) Not just for number of seeds – that is pt. 5.
		[Total: 13]	

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