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

0610/51 Paper 51 (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 must be read in conjunction with the question papers and the report on the examination.

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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.
<u>Small</u>	underlined words – this word only/must be spelled correctly
ref./refs.	answer makes appropriate reference to
AVP	additional valid point (e.g. in additional guidance)
ecf.	error carried forward

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Question	Mark scheme		Guidance
1 (a) (i)	Drawing: **O** quality mark – clear complete lines, shape and size larger than photograph, (6 cm) no shading / proportion; **L** more than 1 layer of wall recognised; **D** asymmetric right side / inside layer folded – detail mark; Any **two** labels if correct: lumen / space / hole; muscles; thick(er) wall / AW; not thick membrane elastic (wall / fibres); connective tissue (outer layer); <u>folded</u> inner layer / endothelium / lining;	[5]	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 no layers and 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' or transport of blood **I.** blood alone, transportation tube alone. (no blood) **A.** correct terms referring to *tunica adventitia / externa* = outer layer; *tunica media* = muscle + elastic tissue; *tunica intima* = endothelium. **I.** reference to 'smooth' 'longitudinal' 'stretching layer' 'radial'. R. striated / cardiac. muscle and elastic on one label = 1 **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.
(ii)	artery;	[1]	**A.** arteries, aorta or specific named artery. I. arteriole. Mark in list order. **R.** vein.

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<table>
<tr><th>Question</th><th>Mark scheme</th><th></th><th>Guidance</th></tr>
<tr><td>(iii)</td><td>OR
<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 / wide AW</td></tr>
</table></td><td>[max 2]</td><td>ecf.

Accept comment from either column.
'X has thick muscular wall' = 2

marks from either side depending on approach. Not comparative.</td></tr>
<tr><td>(b) (i)</td><td>column 2 of internal diameter recorded:–
all boxes completed;
trend shown getting larger;
correct units / mm;
column 3 of differences in increase;
all boxes completed;
first box calculated by instructions;
cumulative difference;</td><td>[6]</td><td>R. any decrease.
If capillary points are made…….ignore – question is to distinguish between X and Y.
Check supervisor's report.

Column 3 – ignore any increase

ecf.</td></tr>
</table>

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Question	Mark scheme		Guidance
(ii)	**A**xes – orientations and labels; **S**cales – linear scale, to fill more than half the printed grid; **P**lot – all correct according to candidate's table; **L**ine – joined point to point with ruled lines or smooth curve;	[4]	(**X** – mass or weight g and **Y** – increase mm) +/- half a small square. **ecf.** – from table. All plotted points (6) to be included on the graph. If plot internal diameter (2nd column) allow: **A**, **S** and **L** – Max 2. **A.** smooth curve passing through most points. **R.** extrapolation of line beyond 50 g. **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. Max 2. **S** wrong – no **P** so only **A** and **L**.
(iii)	section of **S1** returns to original size;	[1]	**A.** if given measurement which less than that recorded for 50 g weight.
(iv)	*(reason)* stretching – must be linked to return in size / decrease / recoil / . reference to elastic limit and to overstretching.; elastic tissue / fibre AW; AVP e.g. ref blood pressure / pulsation;	[max 2]	Do not accept 'muscles are elastic'
		[Total 20]	

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<table>
<tr><th>Question</th><th>Mark scheme</th><th></th><th>Guidance</th></tr>
<tr><td>2 (a) (i)</td><td>Two from:
Both are firm / hard in texture;
Skin / outer layer / indicating grown in soil / peel / darker than inside;
Same colour of inside tissue;
Both have 'buds' / spots / eyes;
Both circular / round;</td><td>[max 2]</td><td>I. testa – not a seed.

A. colour if given – yellowish / purple – check Supervisor's report.
Do not accept scale leaves.

Check similarities given – do not award same point if given as differences.</td></tr>
<tr><td>(ii)</td><td><table>
<tr><th>Feature</th><th>S2 sweet potato</th><th>S3 irish potato</th></tr>
<tr><td>inner tissue</td><td>spotted / speckled / orange or yellow / hard / darker / dry;</td><td>no spots / uniform / yellow / soft / lighter / moist;;</td></tr>
<tr><td>skin /peel / wall</td><td>darker / thicker / rough</td><td>lighter / thinner / smooth;</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 / thinner</td><td>oval;
larger;</td></tr>
</table></td><td>[2]</td><td>Accept any two difference if compared feature. A.(-er) wording.

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.

Ignore diameter reference.</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Mark scheme</th><th></th><th>Guidance</th></tr>
<tr><td>(b)</td><td>
<table>
<tr><th></th><th>S2</th><th>S3</th></tr>
<tr><td>observation</td><td>black</td><td>black;</td></tr>
<tr><td>conclusion</td><td>starch present</td><td>starch present;</td></tr>
</table>
</td><td>[2]</td><td>A.
Both the same

Not blue alone. Starch present in both tissues.

Not carbohydrate

Mark crossed out work if not replaced.</td></tr>
<tr><td>(c) (i)</td><td>4 from:
equal sample – same mass;
equal volumes / amount of added water;
Benedict's solution;
same volume of Benedicts reagents;
heating in water bath;
expected colour change;
compare colours / faster change / depth of colour / wait to see colour change; [4]

safety:- must have ONE
test-tube holders;
tie back hair / tie / lab coat;
safety goggles / spectacles; [1]</td><td>[max 5]</td><td>Not just warm but heat – maybe used a boiling water bath. 60°C +.
I. repeats.

If describe biuret ignore description of test but allow safety point.

Do not award 5 marks for procedure points. 4 + 1.</td></tr>
<tr><td>(ii)</td><td>reported colours for S2;
reported colour for S3;
deduction – S2 had higher reducing sugar / glucose content than S3;</td><td>[3]</td><td>Both turned red = 2. Both contained reducing sugar = 1.
Both no change – no reducing sugar = 2 max.

Comparative. A. if reversed. Check Supervisor's report
Accept results given in table.</td></tr>
</table>

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Question	Mark scheme		Guidance
(d) (i)	equal sample; equal volume of (biuret) reagents; named reagents / biuret; expected colour change;	[max 3]	Need original and final colours for expected change. **R.** pink.
(ii)	**S2** – faint purple colour / none visible – very little protein difference / none recorded; **S3** deeper mauve / lilac / purple – Protein or more protein present;	[2]	Check Supervisor's report. Check candidates results. For each sample – colour change and deduction. If both blue – look for different shades.
		[Total: 19]	

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