

**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.

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

CIE is publishing the mark schemes for the May/June 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



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### 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
- 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)	<p>Drawing: <b>O</b> quality mark – clear complete lines, shape and size larger than photograph, (6 cm) no shading / proportion;  <b>L</b> more than 1 layer of wall recognised;  <b>D</b> asymmetric right side / inside layer folded – detail mark;</p> <p>Any <b>two</b> 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;</p>		<p>Score the drawing by a vertical row of ticks or crosses in order <b>O</b>, <b>L</b> and <b>D</b> shown to the uncluttered side of the drawing.  <b>A.</b> if circles are incomplete to show more than one layer.  If drawn only the vein, <b>Y</b> – award <b>O</b> only no layers and accept lumen label.  If a compass or equivalent has used – do not award <b>O</b> mark.  Look for 'bulge' in wall of blood vessel not the 'floating' bit in the middle.</p> <p>Lumen = AW e.g. 'room for blood' or transport of blood  <b>I.</b> blood alone, transportation tube alone. (no blood)  <b>A.</b> correct terms referring to <i>tunica adventitia / externa</i> = outer layer; <i>tunica media</i> = muscle + elastic tissue; <i>tunica intima</i> = endothelium.  <b>I.</b> reference to 'smooth' 'longitudinal' 'stretching layer' 'radial'. R. striated / cardiac.  muscle and elastic on one label = 1  <b>I.</b> 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.</p>
(ii)	artery;	[5]	<p><b>A.</b> arteries, aorta or specific named artery. <b>I.</b> arteriole.  Mark in list order.  <b>R.</b> vein.</p>

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(iii)	<p style="text-align: center;"><b>OR</b></p> <table border="1"> <tr> <td>feature</td> <td><b>X</b> – artery</td> <td><b>Y</b> – 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>	feature	<b>X</b> – artery	<b>Y</b> – vein	shape in section	round	oval	wall thickness	thick	thin	lining	folded / AW	smooth / AW	tissue	(more) muscle / elastic	less	lumen size	small / AW	large / wide AW	[max 2]	<p><b>ecf.</b></p> <p>Accept comment from either column. 'X has thick muscular wall' = 2</p> <p>marks from either side depending on approach. Not comparative.</p>
feature	<b>X</b> – artery	<b>Y</b> – vein																			
shape in section	round	oval																			
wall thickness	thick	thin																			
lining	folded / AW	smooth / AW																			
tissue	(more) muscle / elastic	less																			
lumen size	small / AW	large / wide AW																			
(b) (i)	<p><i>column 2 of internal diameter recorded:-</i> all boxes completed; trend shown getting larger; correct units / mm; <i>column 3 of differences in increase;</i> all boxes completed; first box calculated by instructions; cumulative difference;</p>	[6]	<p><b>R.</b> any decrease. If capillary points are made.....ignore – question is to distinguish between <b>X</b> and <b>Y</b>. Check supervisor's report.</p> <p>Column 3 – ignore any increase</p> <p><b>ecf.</b></p>																		

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(ii)	<p><b>Axes</b> – orientations and labels;  <b>Scales</b> – linear scale, to fill more than half the printed grid;  <b>Plot</b> – all correct according to candidate's table;  <b>Line</b> – joined point to point with ruled lines or smooth curve;</p>	[4]	<p>(<b>X</b> – mass or weight g and <b>Y</b> – increase mm)  +/- half a small square.  <b>ecf.</b> – from table.  All plotted points (6) to be included on the graph.  If plot internal diameter (2<sup>nd</sup> column) allow: <b>A, S</b> and <b>L</b> – Max 2.  <b>A.</b> smooth curve passing through most points.  <b>R.</b> extrapolation of line beyond 50 g. <b>R.</b> thick lines.  Straight line, non linear scale allow <b>A</b> only if correct.  Score the drawing by a vertical row of ticks or crosses in order <b>A, S, P</b> and <b>L</b>.  Histogram – <b>A, P</b> only. Max 2.  <b>S</b> wrong – no <b>P</b> so only <b>A</b> and <b>L</b>.</p>
(iii)	section of <b>S1</b> returns to original size;	[1]	<b>A.</b> if given measurement which less than that recorded for 50 g weight.
(iv)	<p>(<i>reason</i>) 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;</p>	[max 2]	Do not accept 'muscles are elastic'
		[Total 20]	

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Question	Mark scheme		Guidance															
2 (a) (i)	<p><b>Two</b> from:</p> <p>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;</p>	[max 2]	<p><b>I.</b> testa – not a seed.</p> <p><b>A.</b> colour if given – yellowish / purple – check Supervisor's report.  Do not accept scale leaves.</p> <p>Check similarities given – do not award same point if given as differences.</p>															
(ii)	<table border="1"> <thead> <tr> <th>Feature</th> <th>S2 sweet potato</th> <th>S3 irish potato</th> </tr> </thead> <tbody> <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> </tbody> </table>	Feature	S2 sweet potato	S3 irish potato	inner tissue	spotted / speckled / orange or yellow / hard / darker / dry;	no spots / uniform / yellow / soft / lighter / moist;;	skin / peel / wall	darker / thicker / rough	lighter / thinner / smooth;	margin	two layers visible not smooth / uneven	one layer; smooth;	section shape	circular / rounded smaller / thinner	oval; larger;	[2]	<p>Accept any <b>two</b> difference if compared feature. <b>A.</b>(-er) wording.</p> <p>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.</p> <p>Ignore diameter reference.</p>
Feature	S2 sweet potato	S3 irish potato																
inner tissue	spotted / speckled / orange or yellow / hard / darker / dry;	no spots / uniform / yellow / soft / lighter / moist;;																
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(b)	<table border="1"> <thead> <tr> <th></th> <th>S2</th> <th>S3</th> </tr> </thead> <tbody> <tr> <td><i>observation</i></td> <td>black</td> <td>black;</td> </tr> <tr> <td><i>conclusion</i></td> <td>starch present</td> <td>starch present;</td> </tr> </tbody> </table>		S2	S3	<i>observation</i>	black	black;	<i>conclusion</i>	starch present	starch present;		<p><b>A.</b> Both the same</p> <p>Not blue alone. Starch present in both tissues.</p> <p>Not carbohydrate</p> <p>[2] Mark crossed out work if not replaced.</p>
	S2	S3										
<i>observation</i>	black	black;										
<i>conclusion</i>	starch present	starch present;										
(c) (i)	<p>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]</p> <p><i>safety:- must have ONE</i> test-tube holders; tie back hair / tie / lab coat; safety goggles / spectacles; [1]</p>		<p>Not just warm but heat – maybe used a boiling water bath. 60°C +.</p> <p><b>I.</b> repeats.</p> <p>If describe biuret ignore description of test but allow safety point.</p> <p>[max 5] <b>Do not award 5 marks for procedure points. 4 + 1.</b></p>									
(ii)	<p>reported colours for <b>S2</b>; reported colour for <b>S3</b>; <b>deduction</b> – <b>S2</b> had higher reducing sugar / glucose content than <b>S3</b>;</p>		<p>Both turned red = 2. Both contained reducing sugar = 1. <b>Both no change – no reducing sugar = 2 max.</b></p> <p>Comparative. <b>A.</b> if reversed. Check Supervisor's report Accept results given in table.</p> <p>[3]</p>									

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(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. <b>R.</b> pink.
(ii)	<b>S2</b> – faint purple colour / none visible – very little protein difference / none recorded;  <b>S3</b> 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.
		<b>[Total: 19]</b>	