

**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.

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.
<u>Small</u>	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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Question	Expected Answers	Marks	Guidance																		
1 (a) (i)	<p>Drawing: <b>O</b> quality mark – clear complete lines, shape and larger than photograph, no shading;  <b>L</b> more than 1 layer of wall recognised;  <b>D</b> asymmetric right side / inside layer folded – detail;</p> <p>Any <b>two</b> 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;</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. 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' <b>I.</b> blood alone.  <b>A.</b> correct terms referring to <i>tunica adventitia</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'. <b>R.</b> striated / cardiac.  <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)	<b>X</b> – <u>artery</u> ;	[5]	<b>A.</b> arteries. or arteriole or specific named artery. Mark in list order. <b>R.</b> vein.																		
(iii)	<table border="1"> <thead> <tr> <th>feature</th> <th><b>X</b> – artery</th> <th><b>Y</b> – vein</th> </tr> </thead> <tbody> <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> </tbody> </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 / AW	[max 2]	<p>'thick muscular wall' = 2</p> <p>marks from either side depending on approach. Not comparative.</p> <p>If capillary points are made... ignore – question is to distinguish between X and Y.</p>
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<b>(b) (i)</b>	14, 15, 16, 17, 17, and 18 in table	[1]	<u>all</u> numbers correct in table.
<b>(ii)</b>	<b>Axes</b> – orientations and labels; <b>Scales</b> – linear scale, to fill more than half the printed grid; <b>Plot</b> – all correct; <b>Line</b> – joined point to point with ruled lines;	[4]	( <b>X</b> – mass of weight g and <b>Y</b> – 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: <b>A</b> and <b>L</b> – Max 2. <b>A.</b> smooth curve passing through most points. <b>R.</b> extrapolation of line beyond 100g. <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.
<b>(iii)</b>	original size, shape or position / decrease / contract; ( <i>reason</i> ) elasticity must be linked to return in size / recoil; thick wall / elastic tissue / AW; AVP e.g. ref blood pressure / pulsation ;	[max 3]	<b>I.</b> expansion / damaged / overstretched. <b>I.</b> reference to elastic limit and to overstretching.
<b>[Total: 16]</b>			

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<b>2 (a) (i)</b>	<b>One visible</b> from; Skin / peel / outer wall / shell; outer layer darker than inside; side buds / spots / 'eyes' present; inner tissue – similar colour;		[1]																								
	<b>(ii)</b>	<table border="1"> <thead> <tr> <th><b>feature</b></th> <th><b>sweet potato</b></th> <th><b>irish potato</b></th> </tr> </thead> <tbody> <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> </tbody> </table>	<b>feature</b>	<b>sweet potato</b>	<b>irish potato</b>	inner tissue	spotted / speckled	no spots, uniform;	skin / peel / wall	darker thicker	lighter; thinner;	shape of ends	pointed / slanted (both ends)	rounded (both ends) ;	overall shape	long / narrow	short / round / more circular / oval;	margin	two layers visible not smooth / uneven	one layer; smooth;	section shape	circular /rounded smaller	oval; larger;	stalk / root *	absent	present;	[max 2]
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3 (a) (i)	dish <b>A</b> – 19/20, dish <b>B</b> – 2/20, and dish <b>C</b> 9/10;;	[2]	<b>A.</b> 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%;; <i>possible working</i> $18 - 2 = 16 \quad \frac{16}{2} \times 100 = 800\%$	[2]	Correct answer = 2 marks. Credit alternative methods of working if answer is incorrect. Might round down dish <b>B</b> to 1 / 10. = 1 mark. Might round up dish <b>C</b> to 18 / 20. = 1 mark. 80% = 1 mark. If error in table – award one working mark if applicable.
(iii)	(dish <b>C</b> no tomato juice and dish <b>B</b> has therefore) there is another chemical in juice which stops the germination AW; same pH as dish <b>B</b> but higher % in <b>C</b> 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 <b>C</b> is referred to from the question by implication. <b>I.</b> dish <b>C</b> has more nutrients Chemicals – accept suitable named examples e.g. Vit. C.
(iv)	dish <b>A</b> – control;  for comparison purposes / see difference;  to show it was not pH 6 – weak acid solution;	[max 1]	Ignore fair test / efficiency. <b>A.</b> to test viability of seeds.

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<b>(b)</b>	<ol style="list-style-type: none"> <li>1. same batch of seeds / same type / same maturity;</li> <li>2. same volume of solution;</li> <li>3. same environmental conditions of oxygen;</li> <li>4. same environmental conditions of light / warmth;</li> <li>5. same number of seeds for each test;</li> <li>6. wash surface of seeds first to remove juice of fruit chemicals / bacteria / spores / AW;</li> <li>7. suitable range of pH solutions / suggest 3 or more named pH / acid solutions;</li> <li>8. how obtained such as use of buffers or named liquids e.g. vinegar.;</li> <li>9. same period of time for soaking or germinating;</li> <li>10. repeat whole procedure / two + dishes or use replicas at the same time;</li> <li>11. plot graph;</li> </ol>	[max 6]	<p>I. mass.</p> <p>I. Same environment alone – too vague.  <b>A.</b> Same temperature.          Need more than one seed for pt 5. few / several – too vague.</p> <p>from low pH to high pH – 3 or more examples. (pt 7)          e.g. strong and weak acid and weak alkali = 3 solutions.</p> <p>I. 'few' or 'several' days. (specified number of days not months)          Not just for number of seeds – that is pt. 5.</p>
<b>[Total: 13]</b>			