

MARK SCHEME for the May/June 2009 question paper
for the guidance of teachers

0610 BIOLOGY

0610/05

Paper 5 (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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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2009	0610	05

Question			Expected Answers	Marks	Additional Guidance
1	(a)		<p><i>Drawing</i> size ; outline ;</p> <p>indication of a number of layers ;</p> <p><i>Labels</i> (brown / red) scales / outer covering / scaly leaves / “skin” ; (fleshy) leaves / layers; growing point / shoot / bud / daughter bulb forming ; stem ; roots ;</p> <p style="text-align: right;">(max 3)</p>	6	<p>measuring at least 5cm in one direction a clear single line, showing narrowing towards the top and detail of base (flattened / roots)</p> <p><i>A maximum of three for labels</i> ACCEPT ‘outer layer’</p>
1	(b)	(i)	<p><i>they both have ...</i> thin , protective covering / skin ; growing point / bud ; ref. to similar colour ; ref. to both , round / circular ;</p>	1 max	<p><i>Look for positive statements, not negative statements</i> NOT ‘both hard’</p>
1	(b)	(ii)	<p><i>Comparative statements must be made</i> correct ref to colour difference ; many , layers / parts , (S1) v. , no layers / one part (S2) ; growing point on inside (S1) v. outside (S2) ; dry / loose , outer layer (S1) v. not dry / attached (S2) ; roots (S1) v. no roots (S2) ; scaly (S1) v. not scaly (S2) ; smooth surface (S1) v. rough surface (S2) ; AVP ;</p>	2 max	<p>and refer specifically to either S1 or S2</p> <p>ACCEPT fleshy leaves v. none ACCEPT no eye(s) v. eye(s)</p> <p>e.g. size difference</p>
1	(c)	(i)	Recorded in Table 1.1		
1	(c)	(ii)	Recorded in Table 1.1		

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2009	0610	05

Question			Expected Answers	Marks	Additional Guidance											
1	(d)	(i)	add Benedict's (reagent / solution) ; specific volume ; heat in water bath / place in hot water / not heated directly ; explanation for using water bath related to <u>safety</u> ; use of , safety spectacles / test tube holder ; explanation for using safety goggles related to <u>safety</u> ; watch / leave , until colour changes / for a few minutes ;	4 max	a few cm ³ or the same volume as the test solution NOT avoiding , burning / scalding IGNORE wearing overalls / no eating / no drinking etc. Needs the idea of it not being an instant change											
1	(d)	(ii)	Recorded in Table 1.1													
Table 1.1			<p>Award 1 mark per correct cell in Table 1.1</p> <table><tr><th rowspan="2">test</th><th colspan="2">observations</th></tr><tr><th>S1</th><th>S2</th></tr><tr><td>starch</td><td>brown / orange / yellow / no change / no reaction ;</td><td>black / blue-black / <u>dark</u> blue ;</td></tr><tr><td>reducing sugar</td><td>green / yellow / orange / brown / red ;</td><td>blue-green / green / no change / no reaction ;</td></tr></table>	test	observations		S1	S2	starch	brown / orange / yellow / no change / no reaction ;	black / blue-black / <u>dark</u> blue ;	reducing sugar	green / yellow / orange / brown / red ;	blue-green / green / no change / no reaction ;	4	<p>ACCEPT unexpected results that are in line with the results shown in the Supervisor's Report IGNORE conclusions, as they are asked for observations</p> <p>S1 must show more reducing sugar than S2 (unless otherwise indicated in Supervisor's Report)</p>
test	observations															
	S1	S2														
starch	brown / orange / yellow / no change / no reaction ;	black / blue-black / <u>dark</u> blue ;														
reducing sugar	green / yellow / orange / brown / red ;	blue-green / green / no change / no reaction ;														

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	IGCSE – May/June 2009	0610	05

Question			Expected Answers	Marks	Additional Guidance
1	(e)		<p>(S1) does not contain starch ; (S1) contains sugars ; (S2) contains starch ; (S2) (perhaps) contains some sugars ;</p> <p>(S1) is a storage organ ; (S2) is (also) a storage organ ;</p> <p>ref to explanation / role of storage organs ; AVP ;</p>	4 max	<p><i>Comments need to be in line with the expected observations (i.e. correct) or consistent with candidate's observations / conclusions</i></p> <p>e.g. potato / S2 , is a (stem) tuber onion / (S1) , is a bulb</p>
			Total	21	

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	IGCSE – May/June 2009	0610	05

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2	(a)	(i)	neck / carotid (pulse) ; temple ; groin / femoral (pulse) ; other suitable location ;	1 max	<i>Labels should point to the appropriate location on Fig. 2.1</i> e.g. foot / thumb pulse / behind knee / inside of elbow
2	(a)	(ii)	artery / blood vessel , near surface ; passing / surge , of blood through , artery / blood vessel ; pressure against bone or cartilage ; AVP ;	2 max	NOT if vein also included NOT 'on skin' NOT if vein also included e.g. ventricular systole blood not , pulsing / surging , in veins
2	(b)	(i)	pulses per 15 seconds recorded for 'attempt 1' ; pulse recorded for further 2 repeats ; calculation x 4 for rate min ⁻¹ ; mean calculated ;	4	ALLOW 12 – 30 beats i.e. 3 replicates in total ALLOW 12 – 30 beats must be correct for all 3 replicates ALLOW ecf mean must be correctly recorded to nearest second or to 1dp ALLOW ecf
2	(b)	(ii)	reliability / identify anomalous reading / AW ; heart rate can vary ;	1 max	e.g. to minimise the effect of mistakes NOT to avoid mistakes IGNORE ref. to accuracy

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	IGCSE – May/June 2009	0610	05

Question			Expected Answers	Marks	Additional Guidance
2	(b)	(iii)	<p>Award 1 mark for a suitable factor and a further mark for an associated explanation relating to its effect on heart rate.</p> <p>exercise ; demand for extra supply of , blood / oxygen / glucose / energy , for <u>muscles</u> ;</p> <p>regular exercise / training ; lowers heart rate ; stress / anxiety / fear / fright / AW / adrenaline ; increase in , * adrenaline / heart rate ; high body mass / obesity / AW ; link with high heart rate ; high blood pressure ; decreases heart rate ; * alcohol ; small quantities increase heart rate / (larger quantities) reduce heart rate / depressant ; * heroin ; decreases heart rate ; caffeine ; increases heart rate ; nicotine / smoking ; increases heart rate ; illness / fever ; raised temperature increases rate ; environmental factor ; corresponding increase or decrease ; AVP suitable factor ; AVP suitable effect ;</p>	4 max	<p>Items indicated with * are specified in the syllabus.</p> <p>ora ora (for being 'at rest')</p> <p>DO NOT CREDIT adrenaline twice</p> <p>ora ora (for low blood pressure)</p> <p>e.g. altitude (gives increase) / high temperature (gives increase) / low temperature (gives decrease)</p> <p>e.g. diet qualified / cholesterol qualified / age qualified</p>

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	IGCSE – May/June 2009	0610	05

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2	(c)	(i)	<p><i>bar chart</i></p> <p>S suitable and even scale on y axis ; starts at 0 or a higher number ; G to fill over half of printed grid (vertically) ; P <u>columns</u> correctly plotted ; ; (two marks)</p>	5	<p><i>Candidates are being judged on their ability to plot the data from Table 2.2</i></p> <p>realistically, 20 or 30</p> <p>8 or more squares high minus 1 for each incorrect plot CREDIT points correctly plotted according to candidate's scale DO NOT CREDIT plots if being used as a line graph – they must be for columns</p>
2	(c)	(ii)	higher body mass corresponds to (s)lower heart beat / ora ;	1	
2	(d)		higher heart rate + lower body mass = (link to) shorter life span / ora ;	1	
			Total	19	