

**MARK SCHEME for the May/June 2010 question paper
for the guidance of teachers**

0610 BIOLOGY

0610/62

Paper 62 (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.

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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
- 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

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Question	Expected Answers	Marks	Guidance										
1 (a) (i)	both have different types of teeth / named teeth / both have teeth on upper and lower jaws;	[1]	I. reference to canines A. have teeth for grinding /chewing										
(ii)	<table border="1"> <thead> <tr> <th>sheep</th> <th>dog</th> </tr> </thead> <tbody> <tr> <td>No teeth /incisors in upper jaw at front</td> <td>Teeth / incisors in front in both jaws;</td> </tr> <tr> <td>Space between front and back teeth / diastema</td> <td>No space / diastema;</td> </tr> <tr> <td>No / short canines</td> <td>long / pointed canines / canines present;</td> </tr> <tr> <td>Ridged / not smooth / interlocking back teeth AW</td> <td>smooth / not so ridged / not interlocking back teeth ;</td> </tr> </tbody> </table>	sheep	dog	No teeth /incisors in upper jaw at front	Teeth / incisors in front in both jaws;	Space between front and back teeth / diastema	No space / diastema;	No / short canines	long / pointed canines / canines present;	Ridged / not smooth / interlocking back teeth AW	smooth / not so ridged / not interlocking back teeth ;	[max 2]	Only accept one correct answer per box. Need correct statement in both columns or correct comparative answer. A. horny pad in sheep / none in dog I. size of incisors / teeth in general as no scale I. space between teeth A. fangs A. correct reference to carnassial teeth I. rough / sharp I. reference to number / spacing of teeth
sheep	dog												
No teeth /incisors in upper jaw at front	Teeth / incisors in front in both jaws;												
Space between front and back teeth / diastema	No space / diastema;												
No / short canines	long / pointed canines / canines present;												
Ridged / not smooth / interlocking back teeth AW	smooth / not so ridged / not interlocking back teeth ;												
(b) (i)	Drawing: O: single clear outline of whole tooth; S: larger size than Fig. 1.2; R: ridges; Label: L: root / crown / ridges/ dentine / enamel /cusp;	[max 2] [max 1]	R. sketched / artistic lines A. shading for dentine only / reject any other shading. I. broken lines, may be due to scanning A. detail of ridges internally or on top surface Mark with a vertical line of ticks / crosses down in order [O, S, R, L] but enter correct total, they may not tally. I. root canal										
(ii)	<table border="1"> <thead> <tr> <th>herbivore</th> <th>carnivore</th> </tr> </thead> <tbody> <tr> <td>ridges / rough / more points</td> <td>Smooth / less or 4 points;</td> </tr> <tr> <td>worn / incomplete enamel / dentine visible</td> <td>not worn / enamel complete / dentine not visible;</td> </tr> </tbody> </table>	herbivore	carnivore	ridges / rough / more points	Smooth / less or 4 points;	worn / incomplete enamel / dentine visible	not worn / enamel complete / dentine not visible;	[2]	Only accept one correct answer per box. A. comparative answer. I. sharp / blunt I. edges I. decay / food remains / plaque / hole I. size / shape / narrow / wide / surface area / black / white				
herbivore	carnivore												
ridges / rough / more points	Smooth / less or 4 points;												
worn / incomplete enamel / dentine visible	not worn / enamel complete / dentine not visible;												

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(c)	less / low protein / fat (in green leaves); (herbivores) take energy in form of carbohydrate (not fat) ; carbohydrate has less energy / half the energy of fat;	[max 2]	If not stated, assume answers refer to herbivores I. less nutrients / reference to carbohydrates I. amylase / chewing / fibre
(d)	Fat: equal amounts food; equal amounts reagents; grind up / homogenise food; add ethanol / alcohol/methanol; dissolve the <u>fat</u> ; pour / decant into tube of water / add water; emulsion / cloudiness / goes white / milky; compare; safety precautions;	[max 6]	<p>A. cut up / chop – any process to increase S.A. I. grind in water A. at any stage I. to dissolve food</p> <p>I. precipitate I. length of time taken for comparison E.g. 'the one which is cloudier / thicker has more fat' = 2 A. one safety precaution e.g. goggles / no naked flame / hair tied back / lab. coat / AVP. I. alcohol is inflammable without safety precaution. If use heat then [max 5] – not safe If omit alcohol / add cooking oil – no marks for emulsion and can only have [max 5]</p> <p>Alternative if no reference to ethanol, then look for grease test: A. Grease test: qual amounts food; qual amounts reagents; grind up / homogenise food; rub on paper; translucent / greasy mark; compare; safety precautions;</p> <p style="text-align: right;">[max 4]</p>
[Total: 16]			

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2 (a) (i)	<table border="1"> <thead> <tr> <th>Upper surface</th> <th>or</th> <th>Lower surface</th> </tr> </thead> <tbody> <tr> <td>shiny</td> <td></td> <td>dull;</td> </tr> <tr> <td>dark(er)</td> <td></td> <td>light(er);</td> </tr> <tr> <td>more varied colour</td> <td></td> <td>uniform colour;</td> </tr> <tr> <td>thick(er) midrib</td> <td></td> <td>thin(ner) midrib;</td> </tr> </tbody> </table>	Upper surface	or	Lower surface	shiny		dull;	dark(er)		light(er);	more varied colour		uniform colour;	thick(er) midrib		thin(ner) midrib;	[max 1]	<p>If not stated, assume answer is for upper surface. Need only one statement, it need not be comparative.</p> <p>I. waxy I. veins</p>															
	Upper surface	or	Lower surface																														
shiny		dull;																															
dark(er)		light(er);																															
more varied colour		uniform colour;																															
thick(er) midrib		thin(ner) midrib;																															
(ii)	<p><u>Working</u>: marks on grid or leaf to show that this leaf was used to calculate area / reference to correct number of squares and part squares (covered by leaf) in working; <u>Answer</u>: Accept 8–11 (cm²);</p>	[2]																															
(b) (i)	<table border="1"> <thead> <tr> <th>Number spines</th> <th>Tally</th> <th>Total no: leaves</th> </tr> </thead> <tbody> <tr> <td>6 or fewer</td> <td></td> <td>1</td> </tr> <tr> <td>7</td> <td></td> <td>0</td> </tr> <tr> <td>8</td> <td></td> <td>0 or 1</td> </tr> <tr> <td>9</td> <td></td> <td>3 or 2</td> </tr> <tr> <td>10</td> <td></td> <td>3</td> </tr> <tr> <td>11</td> <td></td> <td>3</td> </tr> <tr> <td>12</td> <td></td> <td>4</td> </tr> <tr> <td>13</td> <td></td> <td>4</td> </tr> <tr> <td>14 or more</td> <td></td> <td>2</td> </tr> </tbody> </table> <p>∴</p>	Number spines	Tally	Total no: leaves	6 or fewer		1	7		0	8		0 or 1	9		3 or 2	10		3	11		3	12		4	13		4	14 or more		2	[3]	<p>Mark incorrect answers with a cross. 1 or 2 incorrect = 2 3 or 4 incorrect = 1 5 or more incorrect = 0 For 8 and 9 spines the answers are linked. Look at 8 spines, if 0 or 1 then 9 spines must be linked as in table. If 8 spines answer is incorrect, mark 9 spines independently, can be 3 or 2. If a cumulative total is given in 'total number of leaves' column then look at 'tally' column and give credit if correct (numbers or tally marks). A. blank box as no leaves for this number of spines.</p>
	Number spines	Tally	Total no: leaves																														
6 or fewer		1																															
7		0																															
8		0 or 1																															
9		3 or 2																															
10		3																															
11		3																															
12		4																															
13		4																															
14 or more		2																															
(ii)	<p>A axes – orientation and labels;</p> <p>S scale – to fill greater than half of grid and to be even (as far as possible);</p> <p>P – heights of columns; N – neat lines – ruler used and columns of equal width;</p>	[4]	<p>Minimum labels are 'spines' [x axis] and 'leaves' [y axis] I. tally alone for axis label.</p> <p>A. '6' or '6 and fewer' and '14' or '14 or more' as labels Check for incorrect use of 0 on x axis e.g. 0–6 = 1 square and 6–7 = 1 square is incorrect. Must label under middle of columns on x axis. If line graph allow A and S only [max 2]</p> <p>A. columns touching or equally spaced.</p>																														

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(iii)	larger sample size ; leaves from trees of same species; use leaves of the same maturity / size / age / AW; sample set number of leaves from growing point e.g. 3 rd leaf back; make sure all from same height of tree;	[max 3]	A. larger as an independent mark. e.g. larger sample different trees = 1. I. repeat alone / repeat with different trees but A. repeat with same type of leaves I. average /accurate
[Total: 13]			
3 (a) (i)	line shows less steep gradient / line levels off / line goes down ;	[1]	could be a time delay, A. change some time after X
(ii)	shortage of food / build up of toxins / lack of space;	[1]	I. optimum / competition
(b) (i) and (ii)	correct label hyphum / hypha / (i) to any part below the spores; spore / (ii) to any of the spores;	[2]	
(c)	no chloroplasts / chlorophyll; cell wall / vacuole / nucleus; cell wall / large or permanent vacuole;	[3]	If not stated then assume answer refers to fungus e.g. no cell wall = 0 I. structures which are not visible e.g. cell membrane / glycogen
(d)	human cells lack cell wall; human cells not affected; bacteria can't grow / killed / weakened / unable to reproduce;	[max 2]	I. living cells, not qualified I. humans unqualified I. references to white blood cells / antibodies / immunity White blood cells / antibodies kill bacteria = 0 A. bacteria burst
(e) (i)	<u>E</u> ;	[1]	more than one letter = 0
(ii)	largest clear area surrounding disk /more bacteria are affected / killed;	[1]	give credit for numerical comparison of clear area I. it spreads more – need idea of less bacteria or larger area cleared
[Total: 11]			