



2010 Biology

Intermediate 1

Finalised Marking Instructions

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Part One: General Marking Principles for Biology – Intermediate 1

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor. You can do this by posting a question on the Marking Team forum or by e-mailing/phoning the e-marker Helpline. Alternatively, you can refer the issue directly to your Team Leader by checking the ‘Referral’ box on the marking screen.
- (b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: BIOLOGY

The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

1. There are no **half marks**. Where three answers are needed for two marks, normally one or two correct answers gain one mark. The Marking Instructions will show how marks should be allocated in questions worth more than one mark.
2. In the mark scheme, if a word is **underlined** then it is essential; if a word is **(bracketed)** then it is not essential.
3. In the mark scheme, words separated by / are **alternatives**.
4. There are occasions where the second answer negates the first and no marks are given. There is no hard and fast rule here, and professional judgement must be applied. The marking instructions cover these eventualities, wherever possible.
5. ‘Bad Biology’ should not result in a mark being awarded. Often, an otherwise correct answer can be negated by a response which is biologically wrong.
6. Where questions on data are in two parts, if the second part of the question is correct in relation to an incorrect answer given in the first part, then the mark can often be given. The general rule is that candidates should not be penalised repeatedly.
7. If a numerical answer is required and units are not given in the stem of the question or in the answer space, candidates must supply the units to gain the mark. If units are required on more than one occasion, candidates should not be penalised repeatedly.

8. Clear indication of understanding is what is required, so:
- if a description or explanation is asked for, a one word answer is not acceptable
 - if the questions ask for **letters** and the candidate gives words and they are correct, then give the mark
 - if the question asks for a word to be **underlined** and the candidate circles the word, then give the mark
 - if the result of a calculation is in the space provided and not entered into a table and is clearly the answer, then give the mark
 - **chemical formulae** are acceptable eg CO₂, H₂O
 - words not required in the syllabus can still be given credit if used appropriately eg Rhesus negative.
9. Incorrect **spelling** can be given. Sound out the word(s),
- if the correct item is recognisable then give the mark
 - if the word can easily be confused with another biological term then **do not** give the mark eg antibodies instead of antibiotics
 - if the word is a mixture of other biological words then **do not** give the mark, eg ‘dormination’.
10. **Presentation of Data:**
- if a candidate provides two graphs or bar charts (eg one in the question and another at the end of the booklet), mark both and give the higher score
 - if the question asks for a line graph and a histogram or bar chart is given, then do not give the mark(s) for the plots. Credit can be given for labelling the axes correctly, or inserting an appropriate scale
 - where a line graph is plotted, the individual points should be joined by a straight line, directly connecting adjacent points. A line of best fit is not acceptable, unless specifically asked for. The plotted point must be in contact with the correct part of the grid provided
 - if the data on the horizontal and vertical axes are transposed, then do not give the mark for labelling axes. A mark may be awarded for plots if the plots are accurate and are plotted against an appropriate scale
 - if the graph used less than 50% of the axes, then do not give the mark
 - if 0 is plotted when no data is given, then do not give the mark (ie candidates should only plot the data given). The same applies to the plots in a line graph continue past the highest value provided, unless candidates have been asked to predict a point beyond the data provided
 - no distinction is made between bar charts and histograms for marking purposes. (For information: bar charts should be used to show discontinuous features, have descriptions on the *x* axis and have separate columns; histograms should be used to show continuous features; have ranges of numbers on the *x* axis and have contiguous columns)
 - where data is read off a graph it is often good practice to allow for acceptable minor error. Any tolerance in an answer is given in the Marking Instructions
 - when plotting points on a line graph, no ‘daylight’ should appear between the plotted point and the place on the grid corresponding to where the plot should be
 - when joining points on a line graph, a single line should be drawn between adjacent plots – do not accept a thick, shaded line or double line

- when plotting a bar chart or histogram, all bars should have a clearly drawn horizontal line across the top AND no ‘daylight’ should be visible between the drawn line and the place on the grid corresponding to where the line should be drawn. Furthermore, plotting only horizontal bars without supporting ‘sides’ to the bar is insufficient
- always check the additional graph paper or pie chart provided towards the end of the question paper
- when drawing a pie chart, the same principles apply – no ‘daylight’, no double lines etc
- although candidates are instructed to use ink throughout (to increase legibility of scanned images), some may have used pencil. Use the zoom facility to ensure marks are read appropriately. A marker should refer paper directly to the Team Leader by checking the ‘Referral’ box on the marking screen if they think the image is difficult to read accurately or if they cannot see a graph but suspect it may have been drawn faintly.

11. Marking from Image: Recording Marks

The question (or part of a question) which is being marked is highlighted. Ensure the mark awarded is entered into the correct box adjacent to the space for the answer. Where the candidate has made no attempt to answer the question, a dash (-) should be entered in the box. Otherwise insert the mark awarded or 0 if the answer is not correct and no mark is awarded.

12. Annotating scripts:

- a mark, zero or a dash (-) is required in each box
- you use the draw tools ✓, ✗ or underline to indicate on the scripts a correct answer or part of answer or an incorrect answer or part of an answer.

13. Use of language

- It is not possible to list every possible way in which candidates may provide a correct answer eg increases, gets higher, gets bigger etc all mean the same and, if correct, the mark should be awarded.
- Candidates often use colloquial or casual language and, where there is no ambiguity and a biological term is not required, the mark should be awarded eg where ‘lower leaves removed’ is an acceptable answer and the candidate’s answer is ‘chop off the lower leaves’, the mark should be awarded.

14. Interpreting an answer

- Candidates frequently provide part of an answer which implies the answer provided in the Marking Instructions. A mark should not be awarded if the marker has to ‘do the work’ or has to make an assumption about what the candidate might have intended with their response.
- Where a conclusion is required, do not accept a re-statement of the results – some form of interpretation of the results to form a conclusion is always required.

15. Biologically correct answers

Where a candidate provides an answer which is correct biologically and is an appropriate answer to the question, the mark should be awarded, even if the exact answer is not provided in the Marking Instructions.

16. One-off answers not covered by the Marking Instructions

- If a response is not covered by the Marking Instructions, consider whether this answer is equivalent to the acceptable answer and if so, award the mark and make a record of your decision as another candidate may have answered in the same way and it is important that you are consistent in your marking.
- If you cannot make a decision, check if the Markers' Forum has a submission which addresses this issue.
- Always consider the Markers' Forum as a source of support and a repository for decisions which you have made.
- You are encouraged to make a decision and to be consistent in applying your decision.
- If a decision cannot be made, however, refer the paper directly to the Team Leader by checking the 'Referral' box on the marking screen.

Part Two: Marking Instructions for each Question

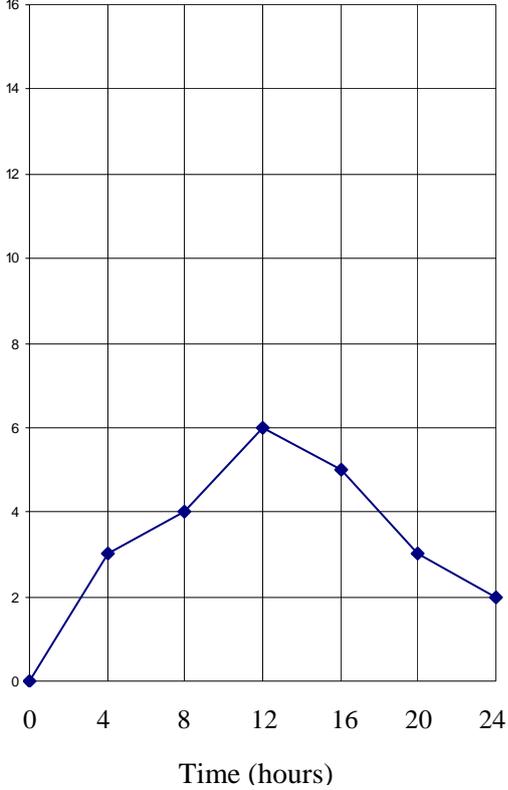
Section A

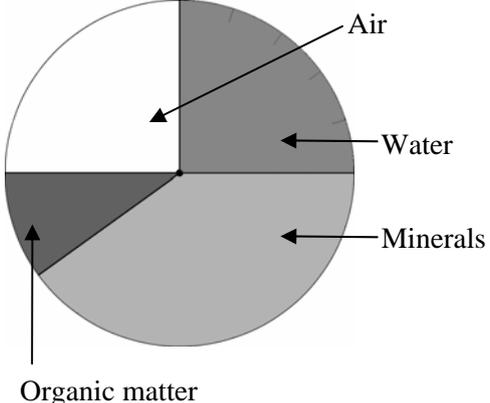
Question		Expected Answer/s	Max Mark	Additional Guidance
1		B	1	
2		A	1	
3		B	1	
4		D	1	
5		C	1	
6		B	1	
7		A	1	
8		B	1	
9		D	1	
10		C	1	
11		D	1	
12		A	1	
13		D	1	
14		A	1	
15		B	1	
16		C	1	

Question			Expected Answer/s	Max Mark	Additional Guidance
17			A	1	
18			A	1	
19			C	1	
20			C	1	
21			B	1	
22			C	1	
23			D	1	
24			A	1	
25			D	1	

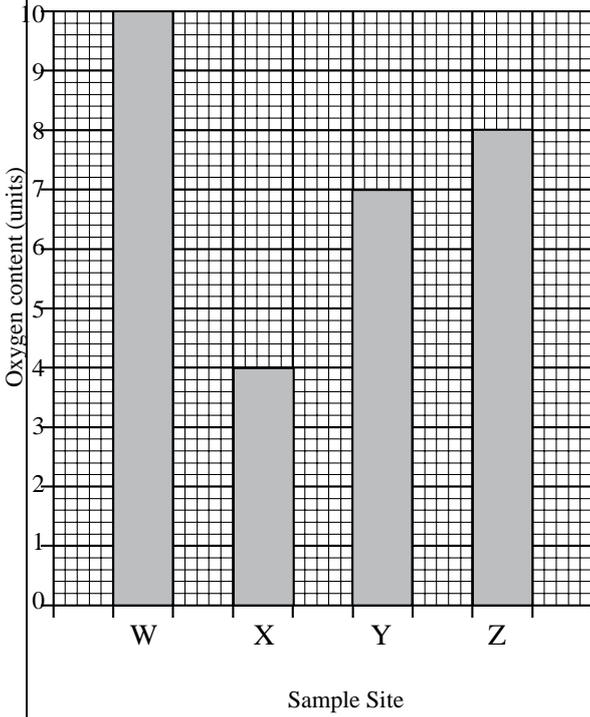
Section B

Question			Expected Answer/s	Max Mark	Additional Guidance
1	a		(Stem) Cuttings	1	Accept 'Taking cutting(s)' Leaf cutting is not acceptable
1	b		Lower leaves removed/(placed in) (sealed) (plastic) bag	1	Must be a feature shown in the diagram. 'Keeping it in the pot/moist peat' alone is not acceptable. Reference to 'Moist peat' does not negate an otherwise acceptable answer.
1	c		Rooting powder/warmth/increase temperature	1	Any other biologically correct answer, not shown in the diagram Do not accept 'add water' as moist peat is mentioned. Do not accept 'add a chemical'. 'Fertiliser' alone is not acceptable.
2	a	i	Control heater/switch the heater off and on/ control temperature	1	Keeps the greenhouse warm is not acceptable.
2	a	ii	<u>Open</u> window/door/fan/air vent/air conditioning	1	Any other correct method within a greenhouse. If response includes window or door, candidates must indicate it being opened or equivalent.

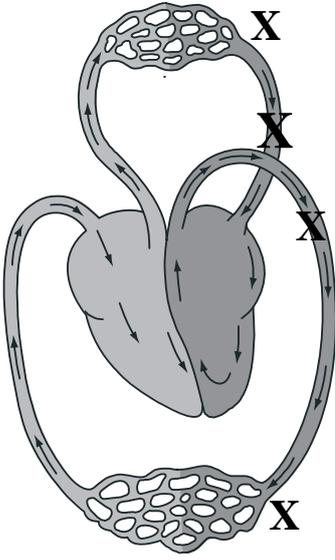
Question	Expected Answer/s	Max Mark	Additional Guidance
2 b	<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">Temperature (°C)</div>  </div> <p style="text-align: center;">Time (hours)</p> <p>(i) Correct scale on horizontal axis = 1</p> <p>(ii) Correct label on horizontal axis (including units) = 1</p> <p>(iii) Correct plots = 1</p>	3	<p>(i) Scale on horizontal axis must be as shown – ie 4, 8, 12 etc at each of the marked ticks.</p> <p>If a candidate marks scale as each small square = 1 hour, do not award mark for scale (5, 10, 15, 20, 25 is incorrect).</p> <p>The full scale is not required but a minimum of two correctly positioned additional scale numbers are required.</p> <p>(ii) Label must show Time and, for the units ‘hours’</p> <p>(iii) Points to be plotted are: 0,0 4,3 8,4 12,6 16,5 20,3 24,2</p> <p>Use the grid on the screen to ensure plots are accurate.</p> <p>Award mark for plots if candidate has accurately plotted points onto an incorrect scale is acceptable (but do not award mark for scale).</p> <p>Points must be joined by a single line which passes through the plots.</p> <p>‘Temperature Outside’ is not required for plot mark</p>

Question			Expected Answer/s	Max Mark	Additional Guidance																
3	a	i	<table border="1"> <tr> <td></td> <td></td> <td></td> <td><u>Particle</u> (size)</td> </tr> <tr> <td></td> <td><u>heavy</u></td> <td></td> <td></td> </tr> <tr> <td><u>loam</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td><u>sand(y)</u></td> <td></td> <td><u>high</u></td> <td><u>large</u></td> </tr> </table> <p>6 correct = 2 3, 4 and 5 correct = 1 0, 1 and 2 correct = 0</p>				<u>Particle</u> (size)		<u>heavy</u>			<u>loam</u>				<u>sand(y)</u>		<u>high</u>	<u>large</u>	2	<p>Size alone is not sufficient in the last column of the top row.</p> <p>'Hard' in the <i>Ease of Digging</i> box for clay (second row of the second column) is not acceptable.</p>
			<u>Particle</u> (size)																		
	<u>heavy</u>																				
<u>loam</u>																					
<u>sand(y)</u>		<u>high</u>	<u>large</u>																		
3	a	ii	<u>Clay</u>	1																	
3	a	iii	<p>Clay soil has high (mineral content) and sandy soil has low (mineral content) or Clay has a higher (mineral content) or Sandy has a lower (mineral content).</p>	1	<p>Reference to the mineral content of the types of soil is acceptable as long as both soil types are named.</p> <p>If only one type is named, then a comparative statement must be made (ie clay has a highER content)</p> <p>Any reference to small/large or air content is incorrect but does not negate an otherwise correct answer.</p>																
3	b	i	 <p>Correct label = 1 Correct portions = 1</p>	2	<p>If the candidate has drawn a rotated version of the pie chart or included segments in a different order, award marks as appropriate as long as the labels and segment sizes are correct.</p> <p>All four labels must be provided for the label mark to be awarded.</p> <p>The segments must intersect with the guide marks around the circumference of the pie chart and with the centre point.</p>																
3	b	ii	4 : 1	1	1:4 and 40:10 are incorrect																

Question			Expected Answer/s	Max Mark	Additional Guidance								
3	c		Nitrogen/Phosphorus/Potassium or N / P / K	1	Accept any other mineral needed by plants. 'Nutrients' alone is not acceptable.								
4	a	i	<u>Mexican Siesta</u>	1	'Mexican' or 'Siesta' alone is not acceptable. Any additional name(s) negates a correct answer.								
4	a	ii	<u>Angel's Braid</u>	1	'Angel's' or 'Braid' alone, 'Angel's lily' or 'Braid lily' are not acceptable. Any additional name(s) negates a correct answer.								
4	a	iii	Three/3	1									
4	b		<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;"><i>Plant maintenance problem</i></th> <th style="width: 50%;"><i>Solution</i></th> </tr> </thead> <tbody> <tr> <td>Overcrowded conditions</td> <td>Dead heading</td> </tr> <tr> <td>Roots growing out of container</td> <td>Potting on</td> </tr> <tr> <td>Plant flowering coming to an end</td> <td>Pricking out</td> </tr> </tbody> </table> <p style="text-align: right;">All 3 correct = 1</p>	<i>Plant maintenance problem</i>	<i>Solution</i>	Overcrowded conditions	Dead heading	Roots growing out of container	Potting on	Plant flowering coming to an end	Pricking out	1	All three lines must be provided.
<i>Plant maintenance problem</i>	<i>Solution</i>												
Overcrowded conditions	Dead heading												
Roots growing out of container	Potting on												
Plant flowering coming to an end	Pricking out												
5	a		Immobilisation/immobilising	1									
5	b		Don't have to separate the product/can re-use (jelly beads/yeast + enzyme)	1	Any other biologically correct answer is acceptable. General statements such as easier to use, fast/faster, or cheaper are not acceptable, unless a clear explanation is provided (for example, by re-using yeast/enzyme).								
5	c	i	<u>sugar</u> to <u>lactic acid</u>	1									
5	c	ii	<u>sugar</u> to <u>carbon dioxide</u>	1									

Question		Expected Answer/s	Max Mark	Additional Guidance																
6	a i	 <p style="text-align: center;">Sample Site</p> <p style="text-align: center;">1 Correct scale on vertical axis = 1 2 Correct label on vertical axis, including units = 1 3 Correct plots = 1</p>	3	<p>(i) Only this scale is acceptable. A minimum of TWO correctly positioned scale numbers are required. Whilst all scale points would be preferred, any two are sufficient.</p> <p>(ii) Full label (with units) required ie <u>Oxygen content (units)</u></p> <p>(iii) All plots have to be accurately plotted. Shading is not required.</p>																
6	a ii	Take more samples (at each site)/repeat/do it again/test again/more sample sites/do the oxygen test(s) again.	1	Specific reference to sampling outwith Sites W to Z would negate an otherwise correct answer.																
6	a iii	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Decreases</th> <th>Stays the same</th> <th>Increases</th> </tr> </thead> <tbody> <tr> <th>Availability of oxygen</th> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> <tr> <th>Number of bacteria</th> <td></td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <th>Number of other organisms</th> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">3 correct = 2 1, 2 correct = 1</p>		Decreases	Stays the same	Increases	Availability of oxygen	✓			Number of bacteria			✓	Number of other organisms	✓			2	
	Decreases	Stays the same	Increases																	
Availability of oxygen	✓																			
Number of bacteria			✓																	
Number of other organisms	✓																			
6	b	Cattle cake/animal feed	1	'Feed' or 'Cake' alone is not sufficient.																

Question			Expected Answer/s	Max Mark	Additional Guidance
7	a	i	Non-bio(logical) Cotton 30 All 3 correct = 1	1	
7	a	ii	90(%)	1	
7	a	iii	A relevant reason why the conclusion is not valid from these results. eg 'different materials were used' or 'only two temperatures were used'.	1	Reference to using different t-shirts alone is not sufficient – reference to the type of material is required. Reference to biological detergent would negate an otherwise correct answer
7	a	iv	Any valid conclusion from these results eg Bio works better than non-bio on cotton at 30°C or Bios work better at 40°C than at 30°C or Bios work best at 40°C	1	Re-statement of results is not acceptable. Any valid conclusion must make reference to temperature.
7	a	v	Water at 30°C	1	Any inclusion of detergent (or a named or different detergent) is not acceptable.
7	b		Toxic to wildlife (or example eg kills fish)/ increase algae/decrease oxygen	1	'Pollution' alone or 'causes pollution' is not acceptable, nor is a vague response such as 'harms the environment'. Reference to bacteria and/or fungi (either increase or decrease) is incorrect unless there is a full biological explanation.
8	a	i	62 (beats per minute)	1	
8	a	ii	98 (beats per minute)	1	
8	a	iii	C and D Both correct = 1	1	
8	b		Lowers/decreases/goes lower	1	Any reference to recovery time alone is incorrect.

Question			Expected Answer/s	Max Mark	Additional Guidance
9	a	i	<p>'X' on any high oxygen blood vessel (it must be on, or pointing to, one of the more darkly-shaded blood vessels) eg</p> 	1	<p>'X' must be on a blood vessel and not a heart chamber</p> <p>If 'X' is placed on capillary, it should be clearly on the right half of the network.</p> <p>If it sits partly on the lighter shading, do not accept</p> <p>The position of the 'X' must clearly indicate a vessel. If there is doubt about what the candidate means, do not award the mark.</p>
9	a	ii	Carbon dioxide/carbon monoxide/salt/sugar/food/nutrients/minerals/waste/any other correct substance eg iron	1	Unacceptable: cells/named types of cell, plasma
9	b	i	Y: Artery/arteries	1	
		ii	Z: Capillary/capillaries		
			Both correct = 1		
10	a		20(%)	1	If the answer is clearly provided in the <i>Space for Working</i> but not inserted into the table, award the mark.
10	b		Body fat sensor/skin (fold) callipers	1	Do not accept 'Callipers' alone or 'Fat callipers'.
10	c		Growth/repair (of cells or named tissue)	1	<p>Do not accept any reference to 'Food' or 'Energy'.</p> <p>Although this may be correct under certain conditions, this is not a main use of protein. This response would also negate an otherwise correct answer.</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
10	d	Anorexia/anorexic/cancer	1	'Fainting' is not acceptable.
11	a	37 (%)	1	
11	b	Dizziness/lack of coordination/loss of concentration/slurred speech/slower reaction time/reaction time increases/hangover/blurred vision/inability to focus/etc	1	<p>Description associated with over consumption (eg sickness or staggering) is acceptable.</p> <p>General term such as 'drunk' or 'drunkenness' are not acceptable.</p> <p>Behaviour associated with over-consumption of alcohol is not acceptable.</p> <p>'Bad eyesight' is not acceptable.</p> <p>Long term effects such as liver/ brain damage are not acceptable.</p>

[END OF MARKING INSTRUCTIONS]