



2014 Biology

Intermediate 2

Finalised Marking Instructions

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Part One: General Marking Principles for Biology Intermediate 2

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.
- (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 Intermediate 2

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.
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. If two answers are given which contradict one another the first answer should be taken. However, 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. Good marking schemes should cover these eventualities.
5. Where questions in 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.
6. 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.

7. 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 question asks for **letters** and the candidates 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
 - contractions used in the Arrangements document eg DNA, ATP are acceptable
 - words not required in the syllabus can still be given credit if used appropriately eg metaphase of meiosis.
8. Incorrect **spelling** is 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 word then **do not** give the mark eg ureter and urethra
 - if the word is a mixture of other biological words then **do not** give the mark, eg melluym, melebrum, amniosynthesis.
9. **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). Credit can be given for labelling the axes correctly, plotting the points, joining the points either with straight lines or curves (best fit rarely used)
 - if the x and y data are transposed, then do not give the mark
 - 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)
 - 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. An answer may be given 7.3 ± 0.1 .
10. **Extended response questions:** if candidates give two answers where this is a choice, mark both and give the higher score.
11. **Annotating scripts:**
- put 0 in the box if no marks awarded – a mark is required in each box
 - indicate on the scripts why marks were given for part of a question worth 3 or 2 marks. A ✓ or X near the answers will do.
12. **Totalling scripts:** errors in totalling can be more significant than errors in marking:
- enter a correct and carefully checked total for each candidate
 - do not use running totals as these have repeatedly been shown to lead to more errors.

Part Two: Marking Instructions for each Question

Section A

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

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

Question			Acceptable/Expected Answer(s)	Max Mark	Additional Guidance [Unacceptable/Negation]
3	(a)	(i)	<u>Gain</u> in <u>dry mass</u> [units not needed]	1	Unacceptable g/grams grain increase By weighing them Gain in mass
3	(a)	(ii)	As CO ₂ concentration increases the growth/ gain /(dry) mass/increases/gets faster. 1	2	Unacceptable double penalty for e.g <i>grain</i> Stops growing
			<u>0.12%</u> (CO ₂) is the point at which growth levels off. 1		
3	(b)		Temperature/light/pH/day length	1	Unacceptable CO ₂ /heat/warmth/ darkness/space/nutrients/ minerals
3	(c)	(i)	Carbon fixation/Calvin cycle/light independent stage/dark reaction	1	
3	(c)	(ii)	ATP or H/H ₂ /hydrogen (carrier) /NADP(H ₂) /enzymes	1	Unacceptable atp/energy Negates ADP/Pi any numbers of ATP
4	(a)		Osmosis	1	
4	(b)		Water moves into the (model) cell/bag/salt solution. 1	2	Accept correct use of hypotonic and hypertonic Unacceptable '... along a concentration gradient' OR HWC/LWC (without explanation)
			From a high <u>water</u> concentration to a low <u>water</u> concentration/down a <u>water</u> concentration gradient. 1 OR <i>alternative answer for 2 marks</i> Water moves from a high <u>water</u> concentration outside to a low <u>water</u> concentration inside the (model) cell/bag/salt solution.		
4	(c)		0.9	1	
4	(d)		Smaller concentration gradient than shown/lower temperature/wider capillary tube/seal not tight/less water in beaker/bag not fully submerged	1	Accept decreased surface area/smaller model cell Unacceptable volume changes for salt solution

Question			Expected Answer(s)	Max Mark	Additional Guidance
5	(a)		Full names copied from diagram mayfly larvae → sticklebacks/dragonfly larvae → kingfishers	1	must finish with the kingfishers
5	(b)		Stickleback, water boatman (larvae), dragonfly (larvae) (all three)	1	Negates Any additional
5	(c)	(i)	They eat the same food/example(s)	1	
5	(c)	(ii)	Stickleback has more food sources/named food sources than dragonfly (must compare/mention both)	1	Unacceptable More food
5	(d)		False habitat 1 False population 1 False (bio)mass/weight 1	3	Unacceptable Sentence changed to match underlined word Amount Negates Mark in both T and F Neither T or F ticked
6	(a)		SS SD/DS All capitals	1 1	Unacceptable other letters commas, large space between letters Negates Any description
6	(b)		2 : 1 : 1	1	
6	(c)		Too few offspring/fertilisation is (a) random (process)	1	Unacceptable Process is random
6	(d)		Co-dominant	1	

Question			Expected Answer(s)	Max Mark	Additional Guidance
7	(a)	(i)	Sequence/order of bases	1	Unacceptable Type of base/named examples Amino acids code for bases
7	(a)	(ii)	Different structure/shape No/different function	1 1	2 Unacceptable Different appearance Different type of protein
7	(b)		Lipase/amylase/trypsin/insulin/glucagon/ catalase/protease Or any other correct.	1	Unacceptable Enzyme/hormone
8	(a)		2, 5, 3, 1, 4	1	
8	(b)		Insulin/factor VIII/antibiotics/rennet/ named non steroid human hormone Or any other correct.	1	Unacceptable Growth hormone Steroid hormones eg testosterone
8	(c)		Increases/higher/faster Increases/higher/larger (must compare)	1 1	2

Question			Expected Answer(s)	Max Mark	Additional Guidance
9	(a)	(i)	Starch	1	Unacceptable maltose
9	(a)	(ii)	Lubricates/moistens food/mouth /helps swallowing	1	
9	(a)	(iii)	Peristalsis	1	
9	(a)	(iv)	<u>small</u> intestine/duodenum B (both needed)	1	
9	(b)		2.5/2 ½	1	
9	(c)		A nitrogen B (simple) sugars/glucose C fats/lipids/oils All correct = 2 marks 1/2 correct = 1 mark	2	Unacceptable maltose
10	(a)	(i)	None in filtrate/ none filtered from glomerulus	1	Unacceptable Restate all figures No protein in glomerulus Negates Mention of urine Bad Biology
10	(a)	(ii)	Too large (to filter through)	1	Unacceptable Because it is useful
10	(b)		It is (all) reabsorbed/absorbed into blood	1	Unacceptable Absorbed/filtered
10	(c)		Liver	1	Unacceptable kidney

Question		Expected Answer(s)	Max Mark	Additional Guidance
11	(a)	R Greater increase in rate (of oxygen absorption) / evidence of comparison 14 and /or 11.8 (both needed)	1	Negates Wrong numbers
11	(b)	See <i>General Marking Advice No 9</i> . X axis label as table and suitable regular scale } use at least 1 Y axis label as table and suitable regular scale } 50% of grid 1 correct plot and line drawn to pass through all points (use their scale) 1	3	Both R and S plotted - lose 1 mark for Y axis Bar graph – lose 1 or 2 marks
11	(c)	3180	1	
11	(d)	Test more athletes/people (with training programme) Test another training programme	1	Unacceptable “repeat it” Increase length of training programme
11	(e)	bronchus 1 bronchioles 1	2	

Question			Expected Answer(s)	Max Mark	Additional Guidance
12	(a)	(i)	Less time to reach maximum/ faster/increases instantly/ Antibodies high for longer/ 1 st remains constant at peak, 2 nd drops immediately	1	Unacceptable 2 nd has higher initial concentration Antibody production lasts longer Starts decreasing quicker Antibody concentration higher
12	(a)	(ii)	140 - 260	1	
12	(a)	(iii)	(Same) subject OR (Same) volume/concentration/mass of substance (P) OR (Same) method of administration	1	Unacceptable Use same substance Amount Volume/concentration/ mass of injection
12	(b)		Lymphocyte	1	
12	(c)		(Each) antibody has a complementary shape to/fits/acts on only one organism/antigen/virus/bacterium	1	Unacceptable Use of 'specific' Confusion with enzymes Disease Certain
12	(d)		Blood cell/macrophage/phagocyte/monocyte/they engulf (and digest) the (foreign) organisms/virus/bacteria	1	Unacceptable Surround/absorb Bad Biology negates

Section C Questions		Expected Answer(s)	Max Mark	Additional Guidance
1	A	<p>Features /Adaptations</p> <p>F1 Superficial/shallow/surface roots</p> <p>F2 Deep/long roots</p> <p>F3 <u>thick waxy cuticle</u></p> <p>F4 spines/reduced leaf area/ small/no leaves/spikes/needles/thorns</p> <p>F5 rounded shape/reduced surface area</p> <p>F6 succulent tissue/large cell vacuoles</p> <p style="text-align: right;">Maximum = 3</p> <p>Reasons/Explanations</p> <p><i>Reason must be linked to feature.</i></p> <p>R1 <u>absorb</u> water from surface/idea of surface (For F1)</p> <p>R2 <u>absorb</u> water from <u>deep</u> underground / water table(For F2)</p> <p>R3 prevent/reduce <u>evaporation</u> (for F3/F4/F5)</p> <p>R4 store water (for F6)</p> <p>R5 Protects plant from animals/predators (F4)</p> <p style="text-align: right;">Maximum = 3</p> <p><i>Labelled diagrams acceptable</i></p>	5	<p>NOT large/tap/ subterranean roots</p> <p>NOT hollow stems</p> <p>NOT reach/get/search for/collect</p> <p>NOT reach/get/search for/collect</p> <p>NOT to prevent water loss</p>
1	B	<p>Changes in Environment</p> <p>E1 due to less factories</p> <p>E2 less <u>air</u> pollution/soot/smoke/fumes</p> <p>E3 more lichen growing</p> <p style="text-align: right;">Maximum = 2</p> <p><i>Ignore 'story' re air pollution</i></p> <p>Changes in Moths (Must be comparative)</p> <p>M1 Natural selection</p> <p>M2 Dark form more visible/less camouflage/ less hidden pale form less visible/more camouflage/more hidden</p> <p>M3 Dark form more highly predated/ more eaten pale form less highly predated/fewer eaten</p> <p>M4 Less dark form survive to breed/ more pale form survive to breed</p> <p>M5 Genes/characteristics for dark form are less likely to be passed on/ genes/characteristics for pale form are more likely to be passed on</p> <p>M6 Dark form become less numerous/ pale form become more numerous</p> <p style="text-align: right;">Maximum = 3</p>	5	<p>NOT cleaner/lighter trees</p> <p>NOT anthropomorphic activity eg hiding from predators</p>

Question		Expected Answer(s)	Max Mark	Additional Guidance
2	B	<p>Gas Exchange</p> <p>E1 Lungs: Oxygen into blood and carbon dioxide out</p> <p>E2 Through alveoli/air sacs</p> <p>E3 Body: oxygen into cells and carbon dioxide out</p> <p style="text-align: right;">Maximum 2</p> <p>Importance</p> <p>I1 Oxygen used for (aerobic) respiration</p> <p>I2 Oxygen used to provide energy</p> <p>I3 Carbon dioxide produced by respiration</p> <p>I4 Carbon dioxide is a waste (product)/toxic/harmful</p> <p style="text-align: right;">Maximum 2</p> <p>General</p> <p>G1 from high to low concentration</p> <p>G2 <i>Idea of:</i> capillary as site of gas exchange</p> <p>G3 One feature of gas exchange surface: large surface area/good blood supply/thin walls/moist surface</p> <p style="text-align: right;">Maximum 2</p>	5	NOT thin cell walls

[END OF MARKING INSTRUCTIONS]