



2013 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

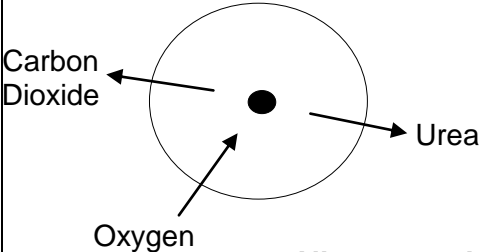
Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
1			B	1		
2			A	1		
3			B	1		
4			D	1		
5			D	1		
6			C	1		
7			B	1		
8			B	1		
9			D	1		
10			A	1		
11			D	1		
12			A	1		
13			A	1		
14			D	1		
15			C	1		
16			B	1		

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
17			C	1		
18			C	1		
19			A	1		
20			D	1		
21			C	1		
22			D	1		
23			C	1		
24			A	1		
25			B	1		

Section B

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates	
1	a	<p>Photosynthesis/makes food Traps/absorbs/takes in light Contains chlorophyll</p> <p>vacuole</p> <p>controls/allows/lets/entry and exit (of materials)</p> <p>All 3 = 2 marks 2/1 = 1 mark</p>	2	<p>Selectively permeable One direction only Protects/holds cell together Decides/chooses</p>	things	
1	b	i	<p>Vacuole/cytoplasm shrunken Membrane/cytoplasm pulled away from wall/cytoplasm concentrated Plasmolysed/flaccid</p>	1	<p>Other single words eg shrunken Plasmolysis</p>	It/cell shrinks
1	b	ii	<p>no net <u>water</u> movement/ equal <u>water/osmosis</u> in and out</p> <p>Equal (water/salt) <u>concentration</u> inside and out/ no <u>concentration</u> gradient</p>	<p>1</p> <p>1</p>	<p>Nothing happens Water does not move in or out Solution moving</p> <p>Water/salt equal</p>	Any reference to cell wall
2	a	<p>X</p> <p>Bacteria/they continued to grow up to disc/no clear zone Bacteria unaffected/not killed</p>	<p>1</p> <p>1</p>	<p>No change Grows around antibiotic disc More bacteria grow</p>	No growth around species X	
2	b	<p>Repeated use/overuse of antibiotics/ course of antibiotics not finished</p>	1	<p>Bacteria immune/evolving/ adapted/created Number of bacteria/ antibiotics used</p>	Wrong biology	
2	c	<p>Fungi/bacteria</p>	1	<p>Yeast / mould Decomposers</p>		

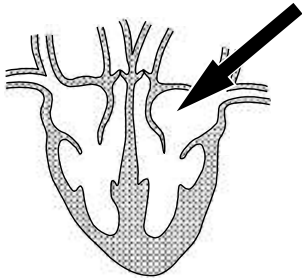
Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates
3	a	It/activity increased then decreased Both needed	1	Restatement of results	
3	b	50	1		
3	c	40	1		
3	d	It/activity is the same at each temperature/not affected by temperature Both parts for 1 mark	1	No effect on carrots Catalase is constant	Catalase acting on carrots (as in digestion)
3	e	<4 <u>enzyme/catalase</u> has been denatured; <u>enzyme/ active site</u> has changed shape temperature too high for activity 4 temperature has no effect on activity/units activity the same for all 3 temperatures	1	Catalysts Damaged/destroyed Substrate no longer fits Optimum/unchanged at 50°C	Killed/died

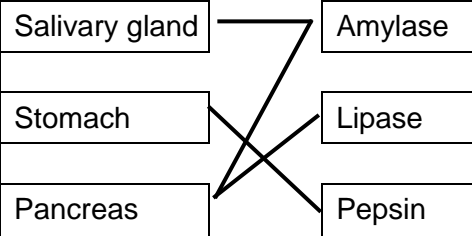
Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
4	a	i	Diffusion	1		Osmosis
4	a	ii	too large to fit/pass through the pores/pass through	1	Insoluble Selectively permeable	Through cell wall
4	a	iii	Increase + <u>water</u> moves in water moves from high <u>water</u> concentration to low / down (water) concentration gradient/ water moves by osmosis/diffusion	1 1	HWC	
4	b		 <p style="text-align: center;">All 3 = 2 marks 2/1 = 1 mark</p>	2		
5	a		carbon dioxide green plants cellulose All 3 = 2 marks 2/1 = 1 mark	2		
5	b		False photolysis/light stage/reaction True False ATP (accept crosses or other mark)	1 1 1	Any full sentence changed	No tick Both T and F ticked

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates
6	a	beak shapes/sizes/structures	1	Head size/colour	
		Different food sources/types (must have comparison with all 3)	1	All 3 not mentioned	
6	b	waxy cuticles/leaves No/Small leaves/spines/spikes Succulent tissues/fleshy stem Only one from the following- Widespread/shallow/superficial /deep/long roots (Accept any other correct answers from Higher Biology) Any two = 2 marks	2	Water storage Large vacuoles Thick/large/lots of roots Large leaves	

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates																					
7	a	To allow them to adjust/ acclimatise/get used to the conditions	1	Adapt Fair/valid/reliable familiarise																						
7	b	Correct scale and exact label on Y axis (<i>only scale below possible</i>) 6 correct plots joined + line labelled 'in dark' (or key)	1 1	Label separate from graph line																						
		<table border="1"> <caption>Data from the graph in question 7b</caption> <thead> <tr> <th>Time (minutes)</th> <th>In light (Number of Woodlice)</th> <th>In dark (Number of Woodlice)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5</td> <td>5</td> </tr> <tr> <td>1</td> <td>6</td> <td>4</td> </tr> <tr> <td>2</td> <td>4</td> <td>6</td> </tr> <tr> <td>3</td> <td>3</td> <td>7</td> </tr> <tr> <td>4</td> <td>2</td> <td>8</td> </tr> <tr> <td>5</td> <td>1</td> <td>9</td> </tr> </tbody> </table>	Time (minutes)	In light (Number of Woodlice)	In dark (Number of Woodlice)	0	5	5	1	6	4	2	4	6	3	3	7	4	2	8	5	1	9			
Time (minutes)	In light (Number of Woodlice)	In dark (Number of Woodlice)																								
0	5	5																								
1	6	4																								
2	4	6																								
3	3	7																								
4	2	8																								
5	1	9																								
7	c	They/woodlice move towards dark/move away from light (<i>idea of movement</i>)	1	Numbers only	Prefer/like																					
7	d	i	Use more woodlice/repeat experiment again	1	Less woodlice Repeat experiment Any design changes Increase time/amount	Additional wrong answers																				
7	d	ii	Temperature/humidity/moisture/damp/ /light/dark (intensity)	1	pH/oxygen/CO ₂ / heat/time/length of paper																					

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
8	a	i	homozygous	1		
8	a	ii	HH hh Both	1		Any other letter used
8	a	iii	purple	1		
8	b	i	<p>H h</p> <p>h Hh hh</p> <p>h Hh hh</p> <p>both parental genotypes</p> <p>correct offspring genotypes</p> <p><i>(no double penalty for use of incorrect gametes/letters?)</i></p>	1 1		No gametes
8	b	ii	1:1 or 2:2	1		

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
9	a		bases amino acids proteins all 3 = 2 marks 2/1 = 1 mark	2		
9	b		<p>Human cell chromosome complement</p> <p>White blood cell 22 + X</p> <p>human female gamete 22 + Y</p> <p>human male gamete 44 + XX</p> <p style="text-align: center;"> 4 lines correct = 2 marks 3/2/1 lines correct = 1 mark (each extra line loses one mark to maximum minus 2) </p>	2		
10	a	i	Q left atrium R tricuspid (valve) OR <u>right</u> atrio-ventricular / <u>right</u> AV (valve)	1 1		
10	a	ii	Stop backflow of <u>blood</u> /so blood only flows in one direction Into the heart/ventricle or from aorta	1 1	Keeps it flowing Valves pushing idea	
10	a	iii	Arrow/line (part within vessel)	1		Wrong biology eg incorrect label on correct arrow extra arrows
						
10	b		Pulmonary artery	1		

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
11	a	i	X = Gall bladder Y = Rectum/large intestine/colon Both	1	intestine	
11	a	ii	 <p>4 lines correct = 2 marks 3/2/1 lines correct = 1 mark (each extra line loses one mark to maximum minus 2)</p>	2		
11	b	i	Large surface area/Capillary network/good blood supply Thin lining/wall Any = 1 mark	1	Thin cell wall It is one cell thick Moist	Has a lacteal
11	b	ii	Hepatic portal vein	1		
11	b	iii	Glycogen	1		

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates
12	a	Increases, then decreases/returns to start value	1		
		Three blood glucose concentrations: 80, 124, 80 (mg/100cm ³) with full unit used at least once + at correct times	1		
12	b	55	1		
12	c	<p>Different volume/mass/wrong concentration of solution Food or drink prior to test/exercise during test/different person any acceptable answer</p> <p style="text-align: right;">Any = 1 mark</p>	1	<p>Wrong solution Human error (on its own) Cross contamination Timing/ amount/quantity different blood glucose concentration at start</p>	

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates
13	a	i	Constriction/vasoconstriction/ become narrower	1	Smaller contracts	Capillaries constrict move away from surface
13	a	ii	Reduces blood flow to skin/less heat lost /more heat retained <i>(if (i) wrong allow mark for correct explanation to match wrong response)</i>	1	No heat loss No blood flow	
13	b		hypothalamus; nerve; increase 3 = 2 marks 2/1 = 1 mark	2		

Section C

Question			Acceptable Answers	Max Mark	Unacceptable answers	Negates		
1	A	a	SA1	Thick muscular wall	1	Thick wall Elastic wall		
			SA2	Narrow/small/thin lumen/ space/cavity	1			
			SV1	Thin, muscular wall	1	Thin wall Elastic wall		
			SV2	Wide/large lumen/ space/cavity	1			
			SV3	Valves	1			
			SC1	Walls one cell thick	1	One cell thick/thin		
			SC2	Large surface area/network	1			
		Max 3 (only 1 from each group)						
		b	FA1	Carry <u>blood</u> at high pressure	1	Oxygenated/ deoxygenated		
			FA2	Away from heart	1	<i>(unless pulmonary exception given)</i>		
			FV1	Carry <u>blood</u> at low pressure	1	Oxygenated/ deoxygenated		
			FV2	Towards heart	1			
			FC1	Link arteries and veins	1			
			FC2	Exchange of materials/ diffusion/osmosis <i>(any correct example eg gas exchange)</i>	1			
Max 3 (only 1 from each group)								
Total max = 5								

Question			Acceptable Answers	Max Mark	Unacceptable Answers	Negates		
1	B	a	B1	One correct name from osmoreceptor/ hypothalamus/ pituitary gland	1			
			B2	Osmoreceptors/ hypothalamus detect water concentration	1			
			B3	Hypothalamus sends messages to the pituitary gland	1			
			B4	Pituitary gland releases hormone	1			
			B5	ADH	1			
			B6	Hormone travels in blood	1			
					(Max 3)			
		b	K1	Increased/more ADH	1			
			K2	Increases permeability of (kidney) tubules/collecting ducts	1	nephron		
			K3	More <u>water</u> reabsorbed/ more <u>water</u> absorbed into <u>blood</u>	1			
			K4	less <u>urine</u> produced	1			
			K5	more concentrated <u>urine</u> produced	1			
					(Max 3)			
Total max = 5								

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates
2	A	<i>(ignore dark form story)</i>			
		1 Two forms/description	1		
		2 Lighter bark/less soot	1		
		3 More lichen	1		
		4 Light form better camouflaged/ blend in/hidden	1		
		5 So less easily seen by predators	1		
		6 Fewer eaten/less predation	1		
		7 More survive to breed/ reproduce	1		
		8 Pass on characteristics/ genes	1		
		9 Numbers of light form increase	1		
		Max 5			

Question		Acceptable Answers	Max Mark	Unacceptable answers	Negates		
2	B	S1	Required gene identified/ located	1			
		S2	Enzymes used	1			
		S3	<u>Gene</u> removed from <u>chromosome</u>	1			
		S4	Plasmid removed from bacterial cell	1			
		S5	Plasmid cut open	1			
		S6	Gene inserted into plasmid/vector	1			
		S7	Plasmid inserted into (new) bacterial/host cell	1			
		S8	Bacterial cells grown/ cultured/multiply	1			
		S9	Insulin/ required product extracted/ purified/made	1			
				Max 3			
		G1	Increased range of products/ Increased rate of production/ increased volume of production/ any other correct advantage	1	Fast/quick Faster than selective breeding		
		G2	High cost of development/ Possible release of genetically modified organisms into environment/transfer of antibiotic resistance/any other correct disadvantage	1	Expensive Release bacteria Moral/ethical issues		
		Max 2					
		<i>(Diagrams must be fully labelled with points above to gain marks)</i>					

[END OF MARKING INSTRUCTIONS]