



2011 Biology

Intermediate 2

Finalised Marking Instructions

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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 assessment 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 ask 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.

2011 Biology Intermediate 2

Section A

- | | | | | | |
|-----|---|-----|---|-----|---|
| 1. | D | 11. | B | 21. | C |
| 2. | B | 12. | C | 22. | D |
| 3. | C | 13. | A | 23. | A |
| 4. | D | 14. | A | 24. | B |
| 5. | A | 15. | C | 25. | A |
| 6. | D | 16. | C | | |
| 7. | B | 17. | A | | |
| 8. | C | 18. | D | | |
| 9. | B | 19. | B | | |
| 10. | D | 20. | B | | |

Marking Instructions

Biology Intermediate 2 2011

Section B

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>1 (a) (i)</p> <p>(ii)</p> <p>(b)</p> <p>(c)</p>	<p>X = (sap) vacuole Y = cytoplasm</p> <p style="text-align: right;">Both for 1 mark</p>	1		
	<p>stores genetic information/DNA/chromosomes controls cell activity(ies)/function(s)</p>	1		
	<p>(potato/starch) phosphorylase</p>	1		
	<p>D = only plants have a cell wall/chloroplast/ vacuole S = both have membranes/cytoplasm/nuclei <i>[Must have a comparison]</i></p>	1 1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
2 (a)	fungi carbon dioxide gasohol 3 = 2 marks 2/1 = 1 mark	2		
(b)	(bacteria) convert <u>lactose to lactic acid</u>	1		Any enzyme or fungi
	lactic acid clots milk/causes curdling	1	thickens	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
3 (a) (i)	X and Y axes labels and units correct (as table)	1	Salt solution	
	(ii) Correct plot and join of all points	1	Line of best fit	Join line to X or Y axis
(b)	type/size/number of potato/cylinders type/pH/volume of <u>(salt) solution</u> temperature any 2 = 1 mark	1	concentration of salt solution amount/level time size of test tube	Additional wrong answer
(c)	5 [or where graph line crosses X axis] no change in <u>mass/weight</u>	1 1	equal concentration inside and outside cell	no osmosis/exchange happens at this concentration
(d)	7 [or correct value from graph]	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
4	(a) enzyme has an active site <i>(must be clear active site on enzyme)</i>	1	Same shape enzyme/active site Enzyme fits substrate (or vice versa) destroyed concentration	
	enzyme/active site is complementary/matching shape/specific to substrate	1		
	(b) denatured/ changes <u>shape</u> / reduced activity/ stops working	1		
	(c) pH OR concentration of enzyme/substrate [any other correct eg Higher]	1		
	(d) water and oxygen [any order] both for 1 mark	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
5	<p>(a) habitat/holt</p> <p>(b) less shelter/home/place to live/habitat/breeding ground/places of safety/food available (more chance of being) seen by predators/prey increased competition for habitat may have to move to another area</p> <p>(c) otter numbers would decrease (otters and mink) in competition for food/fish/habitat [<i>idea of competition</i>]</p> <p>(d) producer</p> <p>eats animals <u>only</u></p> <p><u>all</u> the plants and animals/ populations/ species/ organisms/ living things (in the ecosystem)</p> <p>3 = 2 marks 2/1 = 1 mark</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p>	<p>no absolutes [eg no home]</p> <p>competition</p> <p>eats meat/organisms/ example such as mammals eat other animals</p>	<p>Interactions</p>

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates	
6	(a)	320	1		
	(b)	50% / 33% / 33.3% / 33.33%	1		
	(c) (i)	(pheno) type/variety of cotton/ plant resistant or not	1	(different) cotton/ resistance/variety/type [<i>on their own</i>]	
	(ii)	to compare mass/yields/ to show any difference in mass/yields is due to variety of cotton	1	as a comparison	
	(iii)	improve/increase reliability of <u>results</u>	1	average	accuracy/validity
	(d)	R cotton produces a higher yield (than V cotton) [<i>must show comparison</i>]	1	R grows/survives more	
	(e) (i)	It is resistant to the boll weevil/insects	1	insects do not feed on them	
(ii)	Less pesticide so fewer insects die	1			

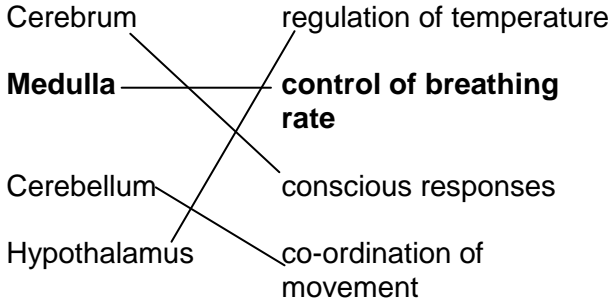
Question	Acceptable Answer	Mark	Unacceptable Answer	Negates	
7	(a) (i) HH, hh	both = 1 mark	1	different letters	
	(ii) Wavy		1		Hh
	(iii) Hh [<i>ok if same letter as (i)</i>]		1	different letters from (i)	wavy
	(b) co-dominant		1		
	(c) order, bases, protein	3 = 2 marks 2/1 = 1 mark	2		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
8 (a)	stomach (1) and <u>small</u> intestine (1) (any order)	2		
(b) (i)	2000	1		
(b) (ii)	$67/66 \cdot 7/66 \frac{2}{3}$	1	66/66.6	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>9 (a)</p> <p>(b)</p> <p>(c)</p>	<p>it increases then decreases</p> <p>maximum/optimum/highest/change at <u>pH8</u></p> <p>depth of clear jelly will be less than 2 mm/any value less than 2mm</p> <p>lipase amylase peptidase (any order) any 2 = 2 marks</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p>	<p>depth of jelly optimum temperature</p> <p>protease</p>	<p>second wrong answer</p>

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a)	hypotonic excreting concentrated 3 = 2 marks 2/1 = 1 mark	2		
(b) (i)	Q = Bowman's capsule	1		
(ii)	(ultra)filtration	1		
(c) (i)	pituitary gland	1		
(ii)	Tubule/collecting duct/loop of Henle	1	capillaries	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	True False speed up False carbon dioxide	1 1 1	higher/water	
(b)	(as) oxyhaemoglobin/(on) haemoglobin	1		
(c)	carbon dioxide/sugars/glucose/amino acids/ proteins/fats/vitamins/urea/hormones/salts/ water/oxygen/antibodies/platelets (or any correct) <p style="text-align: right;">any 2 = 1 mark</p>	1	nutrients/waste/dissolved food/ (named)blood cells	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	 <p> Cerebrum — regulation of temperature Medulla — control of breathing rate Cerebellum — conscious responses Hypothalamus — co-ordination of movement </p> <p><i>[mark awarded only if correct one-to-one relationship]</i></p> <p>3 = 2 marks 2/1 = 1 mark</p>	2		Two lines from one part
(b) (i)	1. sensory 2. relay/association/interneurone 3. motor <p>3/2 correct names = 1 mark All 3 in correct order = 1 mark</p>	2		
(ii)	provides a rapid response/ protects the body (from harm)/ prevent further damage	1	Protection/rapid Prevents harm example on its own	

Section C

Question 1A

N1	X is a pyramid of numbers	MAX 1
N2	oak tree few/one	} MAX 2
N3	caterpillar more numerous than oak	
N4	any correct number relationship between hawk and thrush or caterpillar and thrush	
N5	numbers decrease moving along the food chain (caterpillar to hawk)	
N6	any correct description of 'block' sizes (<i>if E6 not awarded</i>)	
E1	oak tree has highest energy	} MAX 2
E2	correct position of any organism in the pyramid	
E3	caterpillar/thrush/hawk level has less energy than any level below	
E4	energy used/decreases/lost at each stage	
E5	(energy lost by) movement/heat/waste products (or any other correct)	
E6	any correct description of 'block' sizes (<i>if N6 not awarded</i>)	

Total 5

Question 1B

M1	Cell A sperm/ <u>male</u> gamete/ <u>male</u> sex cell	MAX 1
M2	(matching/homologous) chromosomes pair or random assortment	} MAX 2
M3	produces variation (<i>if F5 not awarded</i>)	
M4	double set/2 sets/diploid/46 chromosomes	
M5	pairs separate	
M6	gametes/sex cell 1 set/haploid/23/ half the number of chromosomes	
M7	<u>four</u> gametes/sex cells produced	
F1	gametes/sex cells fuse	
F2	any correct description of fusion of gamete/sex cell <u>nuclei</u> (<i>must indicate male/female</i>)	
F3	to form a zygote	
F4	this is a random process	
F5	produces variation (<i>if M3 not awarded</i>)	
F6	X sperm produce female offspring/Y sperm produce male offspring	
F7	zygote contains/restores 2 sets/diploid/46 chromosomes	

Total 5

Question 2A

G1	overall equation [<i>not under stage 1</i>]	}	MAX 3
G2	first stage is glycolysis		
G3	enzyme controlled (<i>if K1 not awarded</i>)		
G4	glucose is broken down/used/raw material		
G5	pyruvic acid is produced		
G6	<u>2</u> ATP produced		
G7	anaerobic stage/no oxygen needed		
K1	second stage enzyme controlled (<i>if G3 not awarded</i>)	}	MAX 3
K2	pyruvic acid used/raw material		
K3	oxygen used/raw material		
K4	<u>36</u> ATP produced/total <u>38</u> ATP produced		
K5	carbon dioxide <u>and</u> water produced		

Total 5

Question 2B

P1	overall equation [<i>including light and chlorophyll</i>][<i>not under stage 1</i>]	}	MAX 3
P2	first stage is photolysis/light reaction		
P3	enzyme controlled (<i>if C2 not awarded</i>)		
P4	light energy trapped by chlorophyll		
P5	water is broken down/used/raw material		
P6	oxygen is released/produced		
P7	ATP/hydrogen is produced		
P8	ATP/hydrogen is passed to second stage		
C1	second stage is carbon fixation/Calvin's cycle/light independent reaction	}	MAX 3
C2	enzyme controlled (<i>if P3 not awarded</i>)		
C3	carbon dioxide is used/raw material		
C4	ATP provides energy/hydrogen used		
C5	hydrogen added to carbon dioxide		
C6	glucose is produced		

Total 5

[*Diagram only answers no direction/stage indicated = no marks*]

[END OF MARKING INSTRUCTIONS]