2009 Biology

Intermediate 2

Finalised Marking Instructions

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 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 CO_2, H_2O
   - 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.

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Section A

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

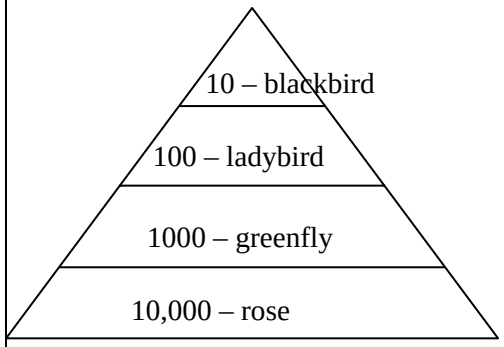
Section B

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
1 (a) (i)	YZX	**1**	Numbers/no reference to diagram	
(ii)	3	**1**		
(b)	protein	**1**		
(c)	(The active site/enzyme/it) is altered/changes shape/structure becomes deformed **OR** No longer specific/fits its substrate **OR** Stops working/becomes inactive *(Describe/Explain requires more than one word)*	**1**	Enzyme becomes disfigured/destroyed/damaged Chemical bonds broken Substrate changes shape Substrate no longer fits/fuses	Killed/died No longer fits the product

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
2 (a)	(pH) 9	**1**		
(b)	pH	**1**	pH of acid concentration Hydrogen peroxide (concentration)	
(c)	Makes the <u>results more</u> reliable To minimise unusual/atypical results	**1**	Accurate/valid Experiment/answer more reliable Minimises error	
(d)	Suitable scale and labels for Y– axis All points correctly plotted and joined with curve or straight line passing through all the points Graph line must cover at least 50% of grid	**1** **1**	Shortened label	
(e)	67 - 87	**1**	66 and less	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
3 (a)	aerobic	**1**		
(b) (i)	X = pyruvic acid/pyruvate	**1**		
	Y = ATP	**1**	energy	Any number except 36/38
(ii)	Oxygen	**1**		
(c) (i)	Anaerobic/fermentation	**1**	Alcohol fermenting	
(ii)	produces alcohol/ethanol	**1**	Needed to make beer/wine Produce carbon dioxide Anaerobic respiration/fermentation	Lactic acid Bread/baking fuel *(list you choose from)*

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
4 (a) (i)	5%	**1**		
(ii)	Only ATP causes muscle/tissue to contract *(Must cover all 3 solutions **and** correct effect)*	**1**	Single solution with effect No mention of muscle/tissue	
(b) (i)	(muscle) fatigue	**1**	Cramp/anaerobic respiration/oxygen debt/any cause of fatigue	
(ii)	it is changed back into pyruvic acid **OR** repay oxygen debt **OR** more oxygen to tissue/muscle/it	**1**	Exercise/resting Breathing in oxygen/ more oxygen	*Wrong Biology* Eg "body going into oxygen debt and changing lactic acid to pyruvic acid"

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
5 (a) (i)	Herbivore/(primary) consumer	1		Secondary consumer Prey
(ii)	 3 correct labels (1) 3 correct numbers (1)	2		Using wrong units
(iii)	Used in/lost as heat/in movement/in waste /indigestible material/lost as waste product **OR** correct example	1	Respiration Lost/used up/wasted Growth and repair/cell division Lost to surroundings/environment Excretion	
(b)	They belong to the same/one species	1	Ladybirds belong to a species Repeat of information in the stem	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
6 (a)	11 : 1	**1**		
(b)	discontinuous	**1**		
(c) (i)	A <u>and</u> B *(Allow with comma or space between)*	**1**	AB *(no space between letters)*	
(ii)	Both alleles are expressed equally in the phenotype **OR** Both are equal/dominant to each other **OR** Both in the phenotype	**1**	Both genotypes are expressed in the phenotype There is no dominance	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
7 (a) (i)	Zygote/fertilised (egg) cell	**1**		List with any incorrect
(ii)	Q	**1**		
(iii)	**Double set** anther, R, embryo **Single set** ovule 4 correct = 2 marks 3/2 correct = 1 mark	**2**		
(b)	Double set (of chromosomes) is restored when the zygote is formed/to restore chromosome number at fertilisation **OR** So offspring have a set (of chromosomes) from each parent **OR** To allow two single sets to join in the zygote/embryo/at fertilisation	**1**	To increase variation Two same gametes fusing	
(c)	Meiosis increases variation 3 = 2 marks 1/2 = 1 mark	**2**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
8 (a)	Temperature **OR** humidity/moisture/damp any 2	**2**	temp/heat/pH/oxygen/carbon dioxide light intensity	List with wrong answers
(b)	Woodlice spend most time in dark/least time in light/(most) woodlice move into the dark/out of the light	**1**	Rate of movement	Likes/prefers/favours
(c)	Protects/Prevents them drying out **OR** escapes/hidden from predators **OR** increases chances of survival	**1**	Be/keep hidden They are most suited to the dark	Any active response eg they hide

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
9 (a) (i)	Variation/difference in size <u>and</u> shape **OR** Length <u>and</u> width/depth/height (*must have range or comparison*)	**1**	Long, pointy (*no comparison*) **OR** larger, longer *(both could be length)*	Anything to do with head size
(ii)	(Availability of different types of) food/habitat/diet/prey/competition for food/habitat	**1**	Natural selection/competition	
(b)	Niche	**1**	Predator/consumer *(food only)*	
(c) (i)	Deforestation/destruction of habitat/hunting/ trapping/pollution/introduction of non-native species/tourism/forestry/farming	**1**		
(ii)	Decrease (due to extinction/dying out of species)	**1**	Extinction/species dies out	Population/numbers

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a) (i)	D C A B	**1**		
(ii)	A or B	**1**		
(b)	false high true false increases Tick must be in the correct position	**1** **1** **1**	Missing ticks	Tick under true plus correct correction

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a) (i)	B	**1**		
(ii)	Less protein in diet/more <u>water</u> intake/dilute urine/low ADH/toxic/poisonous High Water Concentration in blood/urine Kidney/liver damage/disease Less deamination	**1**	ADH not present	
(iii)	(Litmus paper turns blue) more quickly/shorter times	**1**	Reaction rate (of enzymes) increases	Higher urine/urea concentration
(iv)	(distilled) water in place of urine (sample)	**1**	No urease (tablet) Boiled urine Water (on its own)	
(b) (i)	glomerulus	**1**		
(ii)	Water/salts/glucose/some materials are absorbed into the blood /reabsorbed/absorbed from the filtrate	**1**	reabsorption (on its own) filtered back	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	D bronchus/bronchi/ (ring of) cartilage A air sac/alveolus (*Sounds like = avioli*,*aveoli*) 4 correct = 2 marks 3/2 correct = 1 mark		areoli	
(b) (i)	15	**1**	not 16	
(ii)	3	**1**	not 5	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a) (i)	Brain and spinal cord (Both for 1 mark)	**1**	spine	
(ii)	Medulla	**1**		
(b) (i)	Sensory neurone/nerve **OR** receptor	**1**	neurone/nerve/sense organ	
(ii)	Pass nerve impulse/message/information (from sensory neurone) to motor neurone	**1**	sends messages to the brain/effector join/connect sensory to motor	
(c)	Reduces harm to the body/to move away from harmful stimuli **OR** Protect from danger/damage/harm **OR** Rapid/automatic/involuntary response to avoid harm/protect	**1**	prevent damage/danger (*No one word answers*)	

Section C

Question 1A

P1	Chlorophyll/chloroplasts absorbs (energy of) light	
P2	to split water into hydrogen and oxygen	
P3	oxygen released	
P4	ATP produced	
P5	Light energy converted to chemical energy	
P6	Hydrogen combines with a hydrogen acceptor	**any 3**
C1	Carbon dioxide enters	
C2	This stage is enzyme controlled	
C3	ATP supplies the energy needed	
C4	Hydrogen joins with carbon dioxide	
C5	Glucose/starch/cellulose is formed.	**any 3**
		max 5
	Diagram **only if no text** 5 labels = 2 marks; 4/3 = 1 mark	

Question 1B

A1	Surrounding/Hypotonic solution has <u>higher</u> <u>water</u> concentration	
A2	Water enters/fills (animal) cells/water diffuses into cells	
A3	By osmosis/from H<u>W</u>C to L<u>W</u>C	
A4	Cells swell	
A5	And burst	
A6	Because no cell wall present	**any 3**
P1	Surrounding/Hypertonic solution has <u>lower</u> <u>water</u> concentration	
P2	Water leaves (plant) cells/water diffuses out of cells	
P3	By osmosis/from H<u>W</u>C to L<u>W</u>C	
P4	Vacuole shrinks	
P5	Cell membrane pulled away from cell wall/cell contents shrink	
P6	Cell becomes plasmolysed/flaccid	**any 3**
	A3/P3 only once	**max 5**

Question 2A

Digestion

D1 Liver manufactures bile
D2 Bile emulsifies fats/forms smaller fat droplets/neutralises stomach contents/acids
D3 Pancreas produces <u>digestive enzymes</u> **OR** named enzyme
Named enzyme plus substrate or product e.g.
D4 amylase breaks down starch
D5 lipase produces fatty acids and glycerol
D6 trypsin breaks down proteins/peptides
any 2 = 2 marks **max 3**

Processing

P1 Glucose used in production of energy/ATP/respiration
P2 Glucose converted to glycogen in <u>liver</u> **OR** Vitamins/minerals stored in the <u>liver</u>
P3 Amino acids used in growth/ repair/protein formation
P4 <u>Excess</u> amino acids deaminated in liver
P5 To form urea **max 3**

max = 5

Question 2B

Antibodies

A1 antibodies produced by lymphocytes **Max 1**

A2 specific to antigen/bacteria/virus/foreign material/microbes
A3 combines/joins/fits with antigen/bacteria/virus/foreign material/microbes
A4 bacteria/virus/foreign material/microbes contain antigens
A5 destroys bacteria/virus/foreign material/microbes **OR** agglutination **Max 2**

Phagocytosis

P1 Phagocytosis carried out by macrophages/phagocytes/monocytes **Max 1**

P2 Cell surrounds/engulfs antigen/bacteria/virus/foreign material/microbes
P3 Into a vesicle/vacuole
P4 Cell digests antigen/bacteria/virus/foreign material/microbes
P5 Using enzymes **Max 2**

Max = 5

[END OF MARKING INSTRUCTIONS]