

**2005 Biology**

**Intermediate 2**

**Finalised Marking Instructions**

**These Marking Instructions have been prepared by Examination Teams for use by SQA Appointed Markers when marking External Course Assessments.**

## 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, if a word separated by / are **alternatives**.
4. If two answers are given which contradict one another the first answers 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 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 CO<sub>2</sub>, H<sub>2</sub>O
  - 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
- is 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  $7.3 \pm 0.1$ .

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.

## 2005 Biology Intermediate 2

### Marking scheme

#### Section A

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

**Marking Instructions****Biology Intermediate 2 2005****Section B**

<b>Question</b>	<b>Acceptable Answer</b>	<b>Mark</b>	<b>Unacceptable Answer</b>	<b>Negates</b>
<b>1 (a)</b>	Salivary gland Gall bladder Large intestine/colon/caecum	<b>3= 2marks 2/1=1mark</b>	rectum	
<b>(b)</b>	F  B  C <b>OR</b> D	<b>1  1  1</b>		
<b>(c)</b>	Glycogen	<b>1</b>	glucagon	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
2 (a) (i)	<p>Carries <u>blood to the kidney</u></p> <p>Bladder stores <u>urine</u></p> <p>urethra</p>	<p><b>4=3marks</b>  <b>3=2marks</b>  <b>2/1=1mark</b></p>	<p>transports waste/oxygen  takes blood away from heart</p> <p>stores urea/liquid waste</p> <p>ureter</p>	
(ii)	<p>Vessel A has a higher oxygen concentration/lower carbon dioxide concentration/higher urea concentration/ higher glucose concentration/higher salt concentration than B</p> <p>OR</p> <p>A has oxygenated blood, B has deoxygenated blood (a comparison must be made)</p>	<p><b>1</b></p>	<p>B has no glucose  A has a higher water concentration than B</p>	
(b)	<p>All glucose is reabsorbed <b>OR</b> All glucose is absorbed into <u>blood</u></p>	<p><b>1</b></p>	<p>glucose is needed by the body  absorbed back  not filtered</p>	
(c) (i)	<p>ADH <b>OR</b> anti diuretic (hormone)</p>	<p><b>1</b></p>		
(ii)	<p>Increases <b>OR</b> decreases <b>OR</b> changes the permeability of the tubules to water  Makes them absorb more <b>OR</b> less water</p>	<p><b>1</b></p>	<p>permeable  makes urine more/less concentrated</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
3 (a)	2:5	1	1:2.5	
(b)	<u>Y axis</u> scale, (0) – 11000) use two numbers to indicate scale label - energy content (joules/g) <u>X axis</u> scale (equal bar width) + bar labels label - Food  Correct plot for all bars	1   1   1	Less than 50% X or Y axis	
(c)	3150	1		
(d)	They have the same <u>energy</u> content <b>OR</b> they have the same amount of energy.	1		

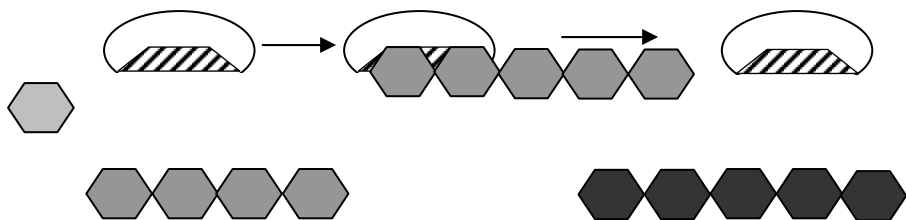
Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
4 (a) (i)	Aorta	1		
	(ii) Pulmonary artery	1		
	(iii) Oxygen	1	Food/energy/dissolved food/ haemoglobin/amino acids/ATP/or other named sugar	
	Glucose	1		
(b) (i)	Lymphocyte	1	white blood cell/monocyte	
	(ii) An antibody is specific <b>OR</b> it has a specific/complementary shape/structure <b>OR</b> its shape fits the disease-causing organism	1	“An antibody can only work against one ....”	
	(iii) Antibody production is faster after second injection  Antibody <u>concentration</u> is greater after second injection (eg “the second injection produced more antibodies”) or converse	1  1	antibody production lasts longer not effective  (no comparison – either feature)	



Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
5 (a) (i)	Diffusion	1		
(ii)	For respiration <b>OR</b> for energy <b>OR</b> to produce ATP <b>OR</b> to release energy	1	to breathe <b>OR</b> to live <b>OR</b> to produce energy for chemical reactions	
(iii)	High low	<b>Both 1</b>		
(iv)	Carbon dioxide/water (vapour)	1	air	
(b)	Thin wall <b>OR</b> one cell <u>thick lining/wall</u> Moist Have a good blood supply <b>OR</b> network of blood vessels Large <u>surface</u> area <b>OR</b> numerous	<b>Any 2</b> <b>1 mark each</b>	thin <b>OR</b> one cell thick cell wall is thin <b>OR</b> membrane thin (semi-)permeable efficient blood supply closely packed	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
6 (a) (i)	Synthesis  (Potato) phosphorylase	1  1	building up/addition	<b>1 correct X and 1 wrong X = 0 mark</b>
(ii)	X drawn anywhere on any active site (within the shaded area on the diagram shown on page 11)	1	X mainly inside enzyme X mainly in glucose molecule	
(b)	Protein	1		
(c)	It changes shape <b>OR</b> becomes deformed <b>OR</b> structure changes <b>OR</b> it has altered shape	1	any consequence [eg not fit <b>OR</b> inactive <b>OR</b> stops working <b>OR</b> destroyed <b>OR</b> lost] alters changes	dies
(d)	Decreases/reduces/lowers/is less	1		

**Q 6 (a) (ii) Diagram**



Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
7 (a) (i)	Green algae copepods dragonfly larvae trout Green algae copepods damselfly larvae trout Green algae copepods dragonfly larvae diving beetle Duckweed mayfly larvae dragonfly larvae diving beetle Duckweed mayfly larvae damsel fly larvae trout Duckweed mayfly larvae dragonfly larvae trout  (ii) Copepods and mayfly larvae  (iii) Any correct pyramid from the web with complete food chain	1   <b>Both for 1 mark</b>  1	pyramid with terms producer etc 8 levels	an extra organism  Extra pyramid with numbers
(b)	Organism <b>OR</b> animal which eats <u>plants and animals</u>	1	Meat/vegetables/veg/mammal A carnivore and a herbivore	
(c)	Biodiversity	1	diversity	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>8 (a) (i)</p> <p>(ii)</p> <p>(b)</p>	<p>15</p> <p>As temperature increases up to 20°C/optimum temperature, decomposition increases</p> <p>After 20°C/optimum temperature, decomposition decreases</p> <p>[eg “as temperature increases decomposition increases then decreases” = 1 mark (no optimum mentioned)]</p> <p>Enzymes <b>OR</b> living organisms <b>OR</b> decomposers <b>OR</b> bacteria <b>OR</b> fungi needed for decomposition <b>OR</b> enzymes denatured at higher temperatures</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Increasing temperature causes increasing decomposition</p>	
<p>(c) (i)</p> <p>(ii)</p>	<p>Bacteria <b>OR</b> fungi <b>OR</b> a named example</p> <p>Return nutrients to the soil <b>OR</b> recycle nutrients <b>OR</b> <u>break down</u> dead/decaying organic material <b>OR</b> <u>break down</u> <u>organic</u> waste</p>	<p>1</p> <p>1</p>	<p>Micro-organisms <b>OR</b> maggots <b>OR</b> worms <b>OR</b> dung beetles <b>OR</b> woodlice</p> <p>Break down minerals <b>OR</b> chemicals <b>OR</b> substances</p> <p>Eat dead animals <b>OR</b> feed on dead animals or waste</p> <p>Produce nutrients <b>OR</b> fertilise soil</p> <p>Provide nutrients <b>OR</b> nitrates</p> <p>Make dead animals into nutrients</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
9 (a)	Eye colour ✓ Height ✓ ✓ Blood group ✓ Hand span ✓ ✓	<b>Each column correct - 1 mark</b>		
(b)	Continuous	1		
(c)	Female  Both sex chromosomes are the same type <b>OR</b> same length <b>OR</b> same shape <b>OR</b> identical Sex chromosomes not XY/no Y chromosome Sex chromosomes are XX Only has XX	<b>Both 1</b>	all chromosomes are X <b>OR</b> only has X <b>OR</b> no small chromosome	
(d)	Gametes            one set            fertilisation	<b>3=2marks 2/1=1mark</b>		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p><b>10 (a) (i)</b></p> <p><b>(ii)</b></p> <p><b>(iii)</b></p>	<p>Each dish should have labelled <b>OR</b> drawn the same number of seeds per dish</p> <p>Each dish should have labelled the percentage of chemical used <b>OR</b> indicate that they are all the same volume</p> <p>Check for signs of germination eg change in height <b>OR</b> length <b>OR</b> mass <b>OR</b> root growth</p> <p>Count the number of seeds germinated (in a given time period)</p> <p>Same number of seeds as Q(i) and water</p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	<p>30 seeds in each dish</p> <p>See if anything grows</p> <p>If no answer to part (i) mark = 0 boiled leaf extract</p>	
<p><b>(b)</b></p>	<p>Stops <b>OR</b> reduces <b>OR</b> no competition <b>OR</b> an example (eg more nutrients available to black walnut trees) <b>OR</b> better chance of survival</p>	<p><b>1</b></p>	<p>One word answer (eg competition) Reduces competition for food Increases their growth Only black walnut trees will grow Prevents germination of other seeds</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	A Beak is long <b>OR</b> narrow <b>OR</b> beak can easily extract insects (from rotting log)	<b>Both 1</b>	bigger beak lives near rotting logs	
(b)	feed on different food  Found in different habitats	<b>1</b>  <b>1</b>	hunt different prey  no comparison	



## Section C

### Question 1A

- |    |  |          |
|----|--|----------|
| A1 | Name – selective breeding  | 1        |
| A2 | Dogs have a variety of characteristics   | 1        |
| A3 | Any example(s) of characteristics  | max of 1 |
| A4 | Dogs <u>selected</u> to breed together   | 1        |
| A5 | Selection <b>OR</b> breeding repeated many times                                     | 1        |
| A6 | Not always reliable <b>OR</b> offspring do not always show desirable characteristics | 1        |
| A7 | It takes a long time(to obtain a breed with the required characteristics)            | 1        |

## Section C

### Question 1B

- |    |  |   |
|----|--|---|
| B1 | Name – natural selection   | 1 |
| B2 | Black form occurs naturally <b>OR</b> by mutation  | 1 |
| B3 | (Pollution) causes trees to be coated with soot <b>OR</b> to blacken <b>OR</b> to change colour/lichen die | 1 |
| B4 | Black form are better camouflaged <b>OR</b> blend in better <b>OR</b> hidden ( <b>not</b> hide)            | 1 |
| B5 | Less chance of being eaten <b>OR</b> seen by predators <b>OR</b> more chance of survival                   | 1 |
| B6 | Greater chance of passing black gene onto next generation <b>OR</b> of breeding                            | 1 |
| B7 | Greater number of black form in next generation  | 1 |

**Or reverse of above for light form**

**Section C**

**Question 2A**

A1	(Both processes involve) anaerobic respiration/fermentation	1	
A2	(Yoghurt cell type) bacteria	1	} max 3
A3	(Yoghurt substrate) lactose/sugar in milk	1	
A4	(Yoghurt product) lactic acid	1	
A5	(biogas cell type) bacteria	1	} max 3
A6	(biogas substrate) organic waste	1	
A7	(biogas product) methane	1	
A8	(gasohol cell type) yeast	1	
A9	(gasohol substrate) sugar(cane)/glucose	1	
A10	(gasohol product) ethanol/alcohol	1	
A11	(Gasohol ) ethanol/alcohol + petrol = fuel /gasohol	1	

**Section C**

**Question 2B**

- |    |  |   |         |
|----|--|---|---------|
| B1 | Carbon dioxide (concentration)   | 1 | } max 2 |
| B2 | Light (intensity)  | 1 |         |
| B3 | Temperature  | 1 |         |
|    |  |   |         |
| B4 | Changing these factors to an <u>optimum</u> level (for photosynthesis)           | 1 | } max 3 |
| B5 | By artificial lighting <b>OR</b> additional heating <b>OR</b> add carbon dioxide | 1 |         |
| B6 | (Rate of) photosynthesis is increased  | 1 |         |
| B7 | More glucose <b>OR</b> food is available (for growth)                            | 1 |         |

[END OF MARKING INSTRUCTIONS]