

**Biology A**

General Certificate of Secondary Education **A223/01**

Unit 3: Ideas in Context plus B7 (Foundation Tier)

**Mark Scheme for June 2010**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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### Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:
  - / = alternative and acceptable answers for the same marking point
  - (1) = separates marking points
  - not/reject** = answers which are not worthy of credit
  - ignore** = statements which are irrelevant - applies to neutral answers
  - allow/accept** = answers that can be accepted
  - (words) = words which are not essential to gain credit
  - words = underlined words must be present in answer to score a mark
  - ecf = error carried forward
  - AW/owtte = alternative wording
  - ORA = or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

- work done = 0 marks
- work done lifting = 1 mark
- change in potential energy = 0 marks
- gravitational potential energy = 1 mark

5. Annotations:
 

The following annotations are available on SCORIS.

  - ✓ = correct response
  - ✗ = incorrect response
  - bod = benefit of the doubt
  - nbod = benefit of the doubt **not** given
  - ECF = error carried forward
  - ^ = information omitted
  - I = ignore
  - R = reject
6. If a candidate alters his/her response, examiners should accept the alteration.
7. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

|                                     |
|-------------------------------------|
| <input type="checkbox"/>            |
| <input type="checkbox"/>            |
| <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> |
| <input type="checkbox"/>            |

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

|                                     |
|-------------------------------------|
| <input type="checkbox"/>            |
| <input type="checkbox"/>            |
| <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> |
| <input type="checkbox"/>            |

This would be worth one mark.

Put ticks (✓) in the two correct boxes.

|                                     |
|-------------------------------------|
| <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> |
| <input type="checkbox"/>            |

This would be worth one mark.

8. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

9. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

|                    |  |
|--------------------|--|
| <b>Edinburgh</b>   |  |
| <b>Manchester</b>  |  |
| <b>Paris</b>       |  |
| <b>Southampton</b> |  |

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

|                    |          |          |          |          |          |          |          |          |          |           |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| <b>Edinburgh</b>   |          |          | ✓        |          |          | ✓        | ✓        | ✓        | ✓        |           |
| <b>Manchester</b>  | ✓        | x        | ✓        | ✓        | ✓        |          |          |          | ✓        |           |
| <b>Paris</b>       |          |          |          | ✓        | ✓        |          | ✓        | ✓        | ✓        |           |
| <b>Southampton</b> | ✓        | x        |          | ✓        |          | ✓        | ✓        |          | ✓        |           |
| <b>Score:</b>      | <b>2</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>NR</b> |

| Question |     | Expected Answers   | Marks | Additional Guidance  |
|----------|-----|--|-------|--|
| 1        | a   | <p><b>any two from:</b><br/> no where to lay eggs/less breeding sites;<br/> no food / less food / more competition;<br/> exposure to predators / predators can see them;<br/> idea of migration;</p>   | [2]   | <b>ignore</b> no where to live/no home   |
|          | b   | 56 (1)   | [1]   | <b>accept</b> 56 out of 124 or 56/124<br><b>reject</b> 45%                                   |
|          | c   | <p><b>action</b><br/> stop using (long) fishing lines (1)<br/> <b>soon</b><br/> because population is being reduced (by 100 000 a year) / leading to extinction;<br/> low reproductive rate / lay only a small number of eggs / slow to mature / long time for population to recover (1)</p> | [2]   |  |
|          | d   | <p><b>any two from:</b><br/> cannot count all/enough of the birds;<br/> difficult to count because birds spread over wide area / birds keep moving;<br/> by the time all the birds had been counted some would have died / been born;</p>  | [2]   | <b>ignore</b> references to migration  |
|          | e   | <p>ban use of/stop using diclofenac (1)<br/> remove the excess carcasses (as soon as the cattle dies) (1)</p>  | [2]   |  |
|          | f   | idea of world wide / gone forever / all dead (1)   | [1]   |  |
|          | g i | <p><b>any two from:</b><br/> idea of fewer organisms;<br/> idea of fewer species / less variety;<br/> in a (specific) place eg ecosystem, habitat, world, Earth, planet, environment;<br/> QWC (1)</p>   | [3]   | <p><b>ignore</b> extinction<br/> QWC answer is clear on first reading even if incorrect.</p> |

| Question |   |     | Expected Answers  | Marks       | Additional Guidance   |
|----------|---|-----|---|-------------|---|
| 1        | g | ii  | idea of ecosystem more stable / effect on other species / keep food chains or webs going / maintains a potential resource for humans (1)  | [1]         | <b>ignore</b> reference to gene pool<br><b>ignore</b> extinction        |
|          | h |     | £5000 m (1)   | [1]         | <b>accept</b> 500 x 10 or £5 000 million or 5 000 000 000               |
|          |   |     | <b>Total</b>  | <b>[15]</b> |   |
| 2        | a |     | autotroph – rose / lettuce<br>heterotroph – greenfly/ladybird/owl/shrew/<br>caterpillar/robin   | [1]         | both required for mark  |
|          | b |     | autotrophs – make own food (1)<br>heterotrophs – do not make own food / eat food (1)  | [2]         | <b>ignore</b> references to making energy                               |
|          | c | i   | sun (1)   | [1]         |   |
|          |   | ii  | food / eating / feeding;  | [1]         | <b>accept</b> consume for eat   |
|          |   | iii | <b>any two from:</b><br>heat;<br>movement;<br>sound;<br>respiration;<br>excretion/urine;<br>egestion/defecating/faeces;<br>uneaten parts; | [2]         | <b>accept</b> examples of movement eg flying<br><br><b>ignore</b> waste |
|          |   |     | <b>Total</b>  | <b>[7]</b>  |   |

| Question |   | Expected Answers   | Marks | Additional Guidance   |
|----------|---|--|-------|---|
| 3        | a | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 2px;">B</div> <div style="border: 1px solid black; padding: 5px; margin: 2px;">C</div> <div style="border: 1px solid black; padding: 5px; margin: 2px;">A</div> </div> | [2]   | B in first box (1)<br>C before A (1)  |
|          | b | storage / converted into starch (1)<br>respiration / energy (1)<br>converted into other chemicals / growth / repair / making seeds (1)   | [3]   | do <b>not</b> accept list of chemical without qualification   |
|          | c | <b>any three from:</b><br><br>humus/dead organisms;<br>biomass / living things;<br>inorganic materials / clay/ sand / rocks / minerals<br>or named minerals;<br>air;<br>water;   | [2]   | 3 correct = 2 marks<br>2 or 1 correct = 1 mark<br><b>ignore</b> examples of dead things eg worm<br><b>ignore</b> examples of living things eg worm<br><br>ignore reference to fertilisers<br>ignore names gases |
|          |   | <b>Total</b>   | [7]   |   |
| 4        | a | temperature;<br>carbon dioxide;<br>light;  | [2]   | <b>accept</b> in any order<br><b>ignore</b> heat / water / minerals<br><br>3 correct = 2 marks<br>2 correct = 1 mark<br>1 correct = 0 marks   |
|          | b | <b>any three from:</b><br>errors in counting;<br>do not know the volume of the bubbles/gases in bubble / bubbles different sizes;<br>some of the oxygen is used by respiration;<br>some bubbles will stick to the pond weed / not float to top;<br>1 minute not long enough;                                       | [3]   | <b>ignore</b> 'human error' on its own<br><br><b>ignore</b> mention changing variable such as temperature as it is only for 1 minute  |
|          |   | <b>Total</b>   | [5]   |   |

| Question |   | Expected Answers   | Marks      | Additional Guidance  |
|----------|---|--|------------|--|
| 5        | a | parasite benefits / feeds on other organism (1)<br>host is harmed (1)  | [2]        | ignore 'lives off' unless qualified<br><b>accept</b> disease as harm                         |
|          | b | correct example (1)<br>feature 1 (1)<br>feature 2 (1)  | [3]        | features described must be appropriate to parasitic life style                               |
|          | c | disease/illness/infection/death /<br>less food production (1)  | [1]        | <b>accept</b> correct named illness eg malaria   |
|          |   | <b>Total</b>   | <b>[6]</b> |  |
| 6        |   | <b>one mark for each set of words used correctly:</b><br>idea that DNA is the cause of the problem / makes<br>someone the carrier of the disease / faulty gene (1)<br><br>DNA/gene <b>taken from</b> white blood cells (1)<br><br>gene probe attaches to (mutated) gene / DNA (1)<br><br>use of autoradiography to locate gene probe (1) | [4]        | <b>ignore</b> reference to cheek cells<br><br><b>ignore</b> reference to UV and fluorescence |
|          |   | <b>Total</b>   | <b>[4]</b> |  |
| 7        | a | carbon dioxide (1)<br>water (1)  | [2]        | <b>accept</b> either way round   |
|          | b | <b>i</b> <b>any two from:</b><br>to supply/use more energy/ATP;<br>by respiration;<br>to avoid anaerobic respiration / lactic acid build up;<br>to contract faster / longer / idea of muscles working<br>harder;   | [2]        |  |
|          |   | <b>ii</b> breathing rate increase (1)<br>heart beat increases (1)  | [2]        | <b>accept</b> heavier/deeper breathing   |
|          |   | <b>Total</b>   | <b>[6]</b> |  |





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