# GCSE

# Biology A

General Certificate of Secondary Education **A221/02**

Unit 1: Modules B1, B2, B3

# Mark Scheme for June 2010

### 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
   <u>words</u>              = 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 **<u>not</u>** 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. | Put ticks (✓) in the two correct boxes. | Put ticks (✓) in the two correct boxes. |
|---|---|---|
| This would be worth 0 marks. | This would be worth one mark. | 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

   | Edinburgh | |
   |---|---|
   | Manchester | |
   | Paris | |
   | Southampton | |

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

   | | | | | | | | | | | |
   |---|---|---|---|---|---|---|---|---|---|---|
   | **Edinburgh** | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
   | **Manchester** | ✓ | ✗ | ✓ | ✓ | ✓ | | | | ✓ | |
   | **Paris** | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
   | **Southampton** | ✓ | ✗ | | ✓ | | ✓ | ✓ | | ✓ | |
   | **Score:** | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | NR |

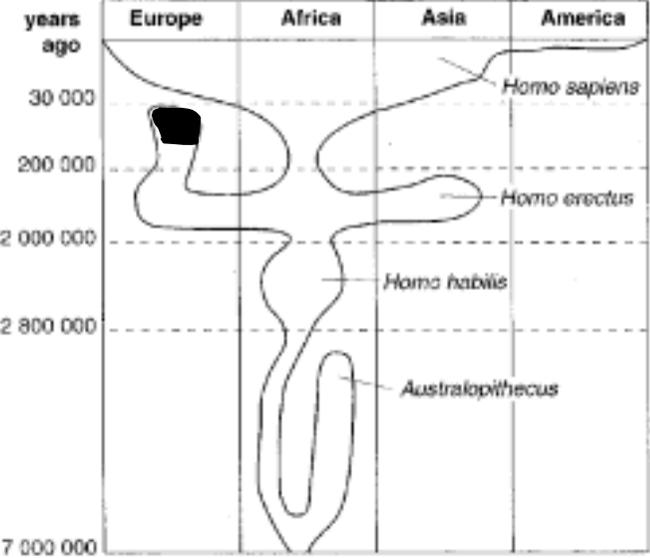| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 1 | a | | Y (1) | [1] | **accept** Y or Y with chromosome above |
| | b | | gene causes development of testes (1) | [1] | **accept** gene codes for/causes production of testosterone/androgens/TDF<br>**ignore** SRY<br>**ignore** reference to male sex organs |
| | c | | height (1) | [1] | |
| | | | **Total** | [3] | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 2 | a | | mum **and** dad (1) | [1] | **accept** parent**s**<br>**reject** one of her parents / mum OR dad |
| | b | i | recessive (1) | [1] | |
| | | ii | A (1) | [1] | |
| | | iii | B, C **and** E (1) | [1] | three correct = 1 mark<br>**accept** any order |
| | | iv | we do not know if E has passed on the CF allele (1)<br>we do not know if E's wife has the CF allele / is a carrier (1)<br>if E's wife has got the CF allele we do not know if she's passed it on (1) | [3] | NB "Her mum" = "E's wife" |
| | | | **Total** | [7] | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 3 | a | | **any two from:**<br>he may not want to know;<br>privacy;<br>may affect his employment prospects;<br>could affect insurance (costs);<br>false neg / false pos / reliability arguments; | **[2]** | **ignore** moral or religious answers |
| | b | | any **staffing implication** answer (1) | **[2]** | eg sacking / redeployment / H&S / suitability of roles<br>**ignore** to see who is healthy, without implication |
| | | | any **financial implication** answer (1) | | eg sickness pay / cost company / loss of production |
| | | | **Total** | **[4]** | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 4 | a | | nucleus from a body cell (1) | [1] | |
| | b | | ... asexual reproduction ... ✓ (✓) <br><br> ... photocopies ... <br><br> ... bacteria ... ✓ (✓) <br><br> ... artist's drawing ... <br><br> identical twins ✓ (✓) <br><br> ... sperm ... | [2] | three correct responses = 2 marks <br> two correct responses = 1 mark <br> if more than three boxes ticked then minus 1 mark for each incorrect answer <br><br> **allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |
| | c | | environmental factors only (1) | [1] | **accept** any other indication of correct response |
| | d | | ... unspecialised ...   ... can develop ... ✓ (1) <br><br> ... unspecialised...   ... cannot develop ... <br><br> ... treat diseases. ✓ (1) <br><br> ... grow different species ... <br><br> ... specialised ...   ... can develop ... <br><br> ... specialised ...   ... cannot develop ... | [2] | if more than two boxes ticked then minus 1 mark for each incorrect answer <br><br> **allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |
| | | | **Total** | [6] | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 5 | a | | <table><tr><td style="background:#808080"></td><td>D</td><td>E</td><td>C</td><td>A</td></tr></table><br>D before E (1)<br>E before C (1)<br>C before A (1) | **[3]** | |
| | b | | ... hormonal ...   ... high mutation ...  ☐<br><br>... hormonal ...   ... low mutation ...  ☐<br><br>... immune ...   ... high mutation ...  ☑ (1)<br><br>... immune ...   ... low mutation ...  ☐<br><br>... nervous ...   ... high mutation ...  ☐<br><br>... nervous ...   ... low mutation ...  ☐<br><br>... reproductive ...   ... high mutation ...  ☐<br><br>... reproductive ...   ... low mutation ...  ☐ | **[1]** | if more than one box ticked then 0 marks<br><br>**allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |
| | | | **Total** | **[4]** | |

| 6 | a | Peter (1) | **[1]** | |
|---|---|---|---|---|
| | b | Ranjit (1) | **[1]** | |
| | c | Stella (1) | **[1]** | |
| | d | Jane **and** Ranjit (1) | **[1]** | either way round |
| | | **Total** | **[4]** | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 7 | a | | Ben;<br>Louise; | **[1]** | two correct responses = 1 mark<br>responses must be in the correct order<br><br>if no response then open up full screen to check for answers elsewhere |
| | b | | **what** – inactive / fake / not real drug / look alike / blank (1)<br><br>**why** - to test/compare results / idea of control (1)<br><br><br>**when** - if health / life of patient would be at risk without effective treatment / if effective treatment is needed(1) | **[3]** | **accept** used instead of actual drug<br><br><br>**accept** to eliminate / control named factors<br>**ignore** used in drugs trials – as that is in stem<br>**ignore** to see if illness has a psychological cause<br><br>**ignore** should not be used on sick people<br>**ignore** ill patients should be given the NEW drug being trialled / should not be given the placebo |
| | | | **Total** | **[4]** | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 8 | a | |  | **[1]** | shading may be extended into the 'L' shape then give mark<br><br>shaded area must not extend significantly beyond the L shape<br><br>shading must not go into central area |
| | b | i | All ...   ... common ancestor.  ☑ (1)<br><br>Only one ...   ... common ancestor.  ☐<br><br>*Australopithecus* ...  ☐<br><br>None ...   ... common ancestor.  ☐<br><br>*Homo erectus* ...  ☐ | **[1]** | **allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 8 | b | ii | ... central evolution. ☐<br><br>... convergent evolution. ☐<br><br>... divergent evolution. ☑ (1)<br><br>... negative evolution. ☐ | [1] | **allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |
| | | iii | *Homo sapiens* (1) | [1] | **accept** humans |
| | c | | **any two from:**<br>idea that brain got bigger / larger / complex / developed;<br>(better chance of) survival / breeding / pass on genes;<br>idea of intelligence eg brighter / smarter;<br>example of intelligence eg using tools / speech / talking / writing / fire; | [2] | <br><br><br>**ignore** live longer<br><br><br>**ignore** learning / knowledge / thinking / self aware / memory<br>**ignore** communication / building / hunting / farming / use of hands/ bipedal |
| | d | | **any two from:**<br><br>idea that not enough evidence / data / results;<br><br><br><br><br>idea of conflicting data/evidence/results / two different explanations, theories or interpretations;<br><br>loss of sponsorship etc; | [2] | **do not credit** specific reference to Darwin or theories of evolution<br>**ignore** no evidence<br>**ignore** reference to God<br>**ignore** arguments about loss of face;<br>**ignore** reference to "thinking you are right"<br><br>**ignore** reference to different experiments / different ideas. |
| | | | **Total** | [8] | |

| Question | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|
| 9 | It proves ... ☐ <br><br> It increases ... ☑ (1) <br><br> It makes no difference ... ☐ <br><br> It decreases ... ☐ <br><br> It agrees with ... ☑ (1) <br><br> It disagrees with ... ☐ | **[2]** | if more than two boxes ticked then minus 1 mark for each incorrect answer <br><br> **allow** any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc |
| | **Total** | **[2]** | |

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