



GCSE Additional Science Biology 2

Higher Tier

Biology 2H

SPECIMEN MARK SCHEME

Version 1.0

Quality of Written Communication and levels marking

In Question 6(b) candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

In order to attain a mark within a certain level, **both** the science **and** the QWC must be of a standard appropriate to that level.

COMPONENT NUMBER: BL2HP

COMPONENT NAME: GCSE Additional Science Biology 2H

STATUS: Specimen V1.0

| question | answers | extra information | mark |
|-----------------|---|----------------------------|-------------|
| 1(a) | water | in this order | 1 |
| | oxygen | | 1 |
| 1(b) | keep temperature constant | | 1 |
| 1(c) | a factor other than temperature is limiting | do not accept water | 1 |
| | eg carbon dioxide | | 1 |
| 1(d)(i) | 21/22 | | 1 |
| 1(d)(ii) | the rate of photosynthesis is at maximum | | 1 |
| | for the least heating cost | | 1 |
| Total | | | 8 |

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| question | answers | extra information | mark |
|-----------------|---|--------------------------|-------------|
| 2 | A – cell membrane | | 1 |
| | B – cytoplasm | | 1 |
| | C – genes / genetic material / chromosome | | 1 |
| | D – cell wall | | 1 |
| Total | | | 4 |

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| question | answers | extra information | mark |
|--------------|---|---|----------|
| 3(a) | area of strips / length of transects / number of transects | | 1 |
| 3(b)(i) | since squirrels are mobile and could be missed / counted twice | | 1 |
| 3(b)(ii) | numbers of larders observed likely to be lower than actual | do not accept squirrels share larders or squirrels have more than one larder | 1 |
| | since unlikely that all could be spotted if 5 m away or old larders or squirrels moved on / died | | 1 |
| 3(c) | (no) the bars show the range of the number of squirrel larders in the different types of woodland | | 1 |
| | although spruce woodlands have the larger ranges, some spruce woodlands will have very low numbers of larders | | 1 |
| Total | | | 6 |

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| question | answers | extra information | mark |
|-----------------|--|--------------------------|--|
| 4(a) | any three from: <ul style="list-style-type: none">• oxygen used in aerobic respiration• more energy from aerobic• carbon dioxide and water end products of aerobic• lactic acid end product of anaerobic | | 3 |
| 4(b) | (Student Y) had <ul style="list-style-type: none">• the lower resting heart rate• the lower heart rate increase and• the quicker recovery time | | 1 1 1 |
| 4(c) | (the increased heart rate delivers) <ul style="list-style-type: none">• more oxygen to muscles and• more glucose to muscles• and results in faster removal of carbon dioxide• and faster removal of lactic acid | | 1 1 1 1 |
| Total | | | 10 |

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| question | answers | extra information | mark |
|-----------------|---|---|-------------|
| 5(a) | because stem cells can (be made) to differentiate | | 1 |
| | into nerve / muscle cells | | 1 |
| 5(b) | ethical issues with destruction / damage to embryo | | 1 |
| 5(c) | mitosis one cell division, meiosis two cell division | | 1 |
| | cells produced by mitosis have two sets of chromosomes, cells produced by meiosis have one set of chromosomes | accept cells produced by mitosis are genetically identical, cells produced by meiosis have some genetic differences | 1 |
| Total | | | 5 |

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| question | answers | extra information | mark |
|-------------|---|---|------|
| 6(a) | (genotype / gametes from P / father) D and d (*) | (*) eg may be in punnett square allow own upper and lower case symbols or allow any symbol correctly used with key | 1 |
| | (genotype / gametes from Q / mother) d and d / accept d (*) | | 1 |
| | offspring genotypes correctly derived from correct gametes(*) | | 1 |
| | offspring phenotypes R and S identified | | 1 |

Question 6 continues on the next page . . .

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Question 6 continued . . .

| 6(b) | | | |
|--|--|---|---|
| Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2. | | | |
| 0 marks | Level 1 (1-2 marks) | Level 2 (3-4 marks) | Level 3 (5-6 marks) |
| No relevant content. | There is a brief description of the issues involved in screening for at least one condition. | There is some description of issues involved in screening for both conditions but there is a lack of both pros and cons for the two conditions. | There is a clear, balanced and detailed description of the issues involved in screening for both conditions, giving pros and cons for each condition. |
| <p>examples of biology points made in the response</p> <p><i>For cystic fibrosis</i></p> <p><i>pros:</i></p> <ul style="list-style-type: none">• reduce number of people with cystic fibrosis (in population)• reduce health-care costs• allows decision / emotional argument eg allows people to make choices about termination <p><i>cons:</i></p> <ul style="list-style-type: none">• possible damage / risk to embryo / fetus / baby• possible harm / risk to mother• (may) have to make ethical / moral / religious decisions <p><i>for polydactyly:</i></p> <ul style="list-style-type: none">• cures 'disfigurement'• but condition not life threatening• so risks to fetus / mother unjustified | | | |
| Total | | | 10 |

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| question | answers | extra information | mark |
|--------------|--|-------------------|----------|
| 7(a) | eggs produced by meiosis | | 1 |
| | therefore contain only half of mother's DNA | | 1 |
| 7(b) | (man B) | no marks | |
| | (child has) mother's 25 / 28 / 30 / 31 or child gets 17 / 19 / 22 / 24 from mother | | 1 |
| | (child has) man B's 10 / 12 / 13 / 14 or child gets 18 / 20 / 21 / 23 from B | | 1 |
| | no bars / DNA / lines from man A correspond to child | | 1 |
| Total | | | 5 |

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| question | answers | extra information | mark |
|-----------------|--|--|----------|
| 8(a) | the enzyme must be lipase | | 1 |
| | since fatty acid produced, which lowered the pH | | 1 |
| 8(b)(i) | 0.25 or $\frac{1}{4}$ | correct answer with / without working if answer incorrect / missing, then evidence of $\frac{8.7 - 7.7}{4}$ gains 1 mark | 2 |
| 8(b)(ii) | bile provides optimum / suitable / best pH for enzyme action therefore the rate of the reaction increased | | 1 |
| Total | | | 5 |

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| question | answers | extra information | mark |
|-----------------|--|--------------------------|-------------|
| 9(a) | there is a lack of valid / reliable evidence | | 1 |
| | because the early organisms soft bodied / remains destroyed by geological action | | 1 |
| 9(b) | populations of salamanders became isolated / separated | | 1 |
| | by areas between mountains | | 1 |
| | there was genetic variation in these isolated communities | | 1 |
| | natural selection acted differently on these isolated communities | | 1 |
| | eventually resulting in interbreeding being no longer possible | | 1 |
| Total | | | 7 |