

**GCSE  
COMBINED SCIENCE: TRILOGY  
8464/B/2F**

Biology Paper 2F

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**Mark scheme**

June 2023

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Version: 1.0 Final



Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from [aqa.org.uk](http://aqa.org.uk)

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## Information to Examiners

### 1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the examiner make their judgement
- the Assessment Objectives and specification content that each question is intended to cover.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right-hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent (for example, a scientifically correct answer that could not reasonably be expected from a student's knowledge of the specification).

### 2. Emboldening and underlining

- 2.1** In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following bullet points is a potential mark.
- 2.2** A bold **and** is used to indicate that both parts of the answer are required to award the mark.
- 2.3** Alternative answers acceptable for a mark are indicated by the use of **or**.  
Alternative words in the mark scheme are shown by a solidus eg allow smooth / free movement.
- 2.4** Any wording that is underlined is essential for the marking point to be awarded.

### 3. Marking points

#### 3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error / contradiction negates each correct response. So, if the number of errors / contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as \* in example 1) are not penalised.

Example 1: What is the pH of an acidic solution?

[1 mark]

| Student | Response | Marks awarded |
|---------|----------|---------------|
| 1       | green, 5 | 0             |
| 2       | red*, 5  | 1             |
| 3       | red*, 8  | 0             |

Example 2: Name **two** magnetic materials.

[2 marks]

| Student | Response              | Marks awarded |
|---------|-----------------------|---------------|
| 1       | iron, steel, tin      | 1             |
| 2       | cobalt, nickel, nail* | 2             |

#### 3.2 Use of symbols / formulae

If a student writes a chemical symbol / formula instead of a required chemical name, or uses symbols to denote quantities in a physics equation, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

#### 3.3 Marking procedure for calculations

Marks should be awarded for each stage of the calculation completed correctly, as students are instructed to show their working. At any point in a calculation students may omit steps from their working. If a subsequent step is given correctly, the relevant marks may be awarded.

Full marks are **not** awarded for a correct final answer from incorrect working.

#### 3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

### 3.5 Errors carried forward

An error can be carried forward from one question part to the next and is shown by the abbreviation 'ecf'.

Within an individual question part, an incorrect value in one step of a calculation does not prevent all of the subsequent marks being awarded.

### 3.6 ic spelling

Marks should be awarded if spelling is not correct but the intention is clear, **unless** there is a possible confusion with another technical term.

### 3.7 Brackets

(.....) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

### 3.8 Allow

In the mark scheme additional information, 'allow' is used to indicate creditworthy alternative answers.

### 3.9 Ignore

Ignore is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

### 3.10 Do **not** accept

Do **not** accept means that this is a wrong answer which, even if the correct answer is given as well, will still mean that the mark is not awarded.

### 3.11 Numbered answer lines

Numbered lines on the question paper are intended to support the student to give the correct number of responses. The answer should still be marked as a whole.

## 4. Level of response marking instructions

Extended response questions are marked on level of response mark schemes.

- Level of response mark schemes are broken down into levels, each of which has a descriptor.
- The descriptor for the level shows the average performance for the level.
- There are two marks in each level.

Before you apply the mark scheme to a student's answer, read through the answer and, if necessary, annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

### **Step 1: Determine a level**

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level.

The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer. Do **not** look to penalise small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level.

Use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 content.

### **Step 2: Determine a mark**

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

You should ignore any irrelevant points made. However, full marks can be awarded only if there are no incorrect statements that contradict a correct response.

An answer which contains nothing of relevance to the question must be awarded no marks.

**Question 1**

| Question | Answers                   | Extra information | Mark | AO / Spec. Ref. |
|----------|---------------------------|-------------------|------|-----------------|
| 01.1     | to produce garden compost |                   | 1    | AO1<br>4.7.3.3  |

| Question | Answers                             | Extra information   | Mark | AO / Spec. Ref.                      |
|----------|-------------------------------------|---|------|--------------------------------------|
| 01.2     | microorganism(s) / bacteria / fungi | allow decomposer(s) / microbe(s)<br>allow mould / mushrooms<br>ignore worm(s) / germ(s) | 1    | AO1<br>4.7.2.2<br>4.7.3.3<br>4.6.3.2 |

| Question | Answers        | Extra information          | Mark | AO / Spec. Ref.    |
|----------|----------------|----------------------------|------|--------------------|
| 01.3     | oxygen         | must be in this order only | 1    | AO1<br>4.7.2.2     |
|          | carbon dioxide |                            | 1    | 4.7.3.3<br>4.6.3.2 |

| Question | Answers                             | Extra information | Mark | AO / Spec. Ref. |
|----------|-------------------------------------|-------------------|------|-----------------|
| 01.4     | $3\,700\,000 \times \frac{46}{100}$ |                   | 1    | AO2<br>4.7.3.3  |

| Question | Answers   | Extra information          | Mark | AO / Spec. Ref.           |
|----------|---|----------------------------|------|---------------------------|
| 01.5     | any <b>one</b> from: <ul style="list-style-type: none"> <li>• climate change</li> <li>• global warming</li> </ul> | allow it is getting warmer | 1    | AO2<br>4.7.3.3<br>4.7.3.5 |

| Question | Answers            | Extra information | Mark | AO /<br>Spec. Ref. |
|----------|--------------------|-------------------|------|--------------------|
| 01.6     | building factories |                   | 1    | AO1<br>4.7.3.3     |
|          | quarrying rocks    |                   | 1    |                    |

|                         |          |
|-------------------------|----------|
| <b>Total Question 1</b> | <b>8</b> |
|-------------------------|----------|



**Question 2**

| Question   | Answers                             |                             |                           |                         | Mark                | AO / Spec. Ref.      |
|--|-------------------------------------|-----------------------------|---------------------------|-------------------------|---------------------|----------------------|
| 02.1   | <b>Variable</b>                     | <b>Independent variable</b> | <b>Dependent variable</b> | <b>Control variable</b> | 1<br><br>1<br><br>1 | AO1<br>4.5.2<br>RPA6 |
|  | Distractions from background sounds |                             |                           | ✓                       |                     |                      |
|  | Reaction time                       |                             | ✓                         |                         |                     |                      |
|  | Type of stimulus                    | ✓                           |                           |                         |                     |                      |
| do <b>not</b> accept more than one tick in any row |                                     |                             |                           |                         |                     |                      |

| Question | Answers                      | Extra information | Mark | AO / Spec. Ref.               |
|----------|------------------------------|-------------------|------|-------------------------------|
| 02.2     | repeat both methods 10 times |                   | 1    | AO3<br>4.5.2<br>4.5.1<br>RPA6 |

| Question | Answers  | Extra information  | Mark | AO / Spec. Ref.               |
|----------|--|--|------|-------------------------------|
| 02.3     | any <b>one</b> from: <ul style="list-style-type: none"> <li>• practice</li> <li>• fewer distractions</li> <li>• familiarity (with test)</li> </ul> | ignore repeating<br><br>allow reference to effect of caffeine<br>allow answers referring to competitiveness<br>eg the student wanted to beat a previous time | 1    | AO3<br>4.5.2<br>4.5.1<br>RPA6 |

| Question    | Answers   | Extra information   | Mark | AO / Spec. Ref.               |
|-------------|---|---|------|-------------------------------|
| <b>02.4</b> | 2 bars correctly plotted<br><b>and</b><br>2 bars correctly labelled as seeing (the stimulus) and hearing (the stimulus) | allow a tolerance of $\pm \frac{1}{2}$ a small square<br>allow any width bars touching or not<br>allow bars in either order | 1    | AO2<br>4.5.2<br>4.5.1<br>RPA6 |
|             | (y axis label) (mean reaction) time in milliseconds / ms  |   | 1    |                               |

| Question    | Answers   | Extra information   | Mark | AO / Spec. Ref.               |
|-------------|---|---|------|-------------------------------|
| <b>02.5</b> | (when seeing stimulus reaction time is) longer / greater / higher | allow converse for hearing stimulus if clearly stated<br><br>allow bigger / larger<br>allow slower (reaction time)<br>allow slower (reactions)<br>allow 130 milliseconds more<br>ignore 130 milliseconds<br>unqualified | 1    | AO3<br>4.5.2<br>4.5.1<br>RPA6 |

|                         |          |
|-------------------------|----------|
| <b>Total Question 2</b> | <b>8</b> |
|-------------------------|----------|

## Question 3

| Question | Answers                                   | Extra information   | Mark | AO / Spec. Ref.        |
|----------|---|---|------|------------------------|
| 03.1     | line approximately perpendicular to river | allow on either side of river<br>ignore length of line<br>do <b>not</b> accept a line parallel to the river | 1    | AO2<br>4.7.2.1<br>RPA7 |

| Question | Answers | Extra information | Mark | AO / Spec. Ref.        |
|----------|---------|-------------------|------|------------------------|
| 03.2     | quadrat |                   | 1    | AO1<br>4.7.2.1<br>RPA7 |

| Question | Answers | Extra information                                 | Mark | AO / Spec. Ref.        |
|----------|---------|---|------|------------------------|
| 03.3     | 6 / six | ignore calculation / range given if mean is clear | 1    | AO2<br>4.7.2.1<br>RPA7 |

| Question | Answers   | Extra information | Mark | AO / Spec. Ref.        |
|----------|-----------|-------------------|------|------------------------|
| 03.4     | increases |                   | 1    | AO3<br>4.7.2.1<br>RPA7 |

| Question | Answers                             | Extra information | Mark | AO / Spec. Ref.        |
|----------|-------------------------------------|-------------------|------|------------------------|
| 03.5     | to know the uncertainty of the mean |                   | 1    | AO3<br>4.7.2.1<br>RPA7 |

| Question    | Answers         | Extra information | Mark | AO / Spec. Ref. |
|-------------|-----------------|-------------------|------|-----------------|
| <b>03.6</b> | light intensity |                   | 1    | AO1<br>4.7.1.2  |
|             | moisture levels |                   | 1    | 4.7.1.1         |

| Question    | Answers  | Extra information  | Mark | AO / Spec. Ref.                      |
|-------------|--|--|------|--------------------------------------|
| <b>03.7</b> | more / increased carbon dioxide (in air)<br><b>or</b><br>less carbon dioxide absorbed / used (by plants) |  | 1    | AO2<br>4.7.2.1<br>4.7.2.2<br>4.7.3.5 |
|             | (due to) less photosynthesis   | allow (due to) more decay / burning (of plants)<br><br>allow <b>2</b> marks for less carbon dioxide used for photosynthesis<br><br>if no other mark awarded allow <b>1</b> mark for carbon dioxide is used in photosynthesis | 1    |                                      |

|                         |          |
|-------------------------|----------|
| <b>Total Question 3</b> | <b>9</b> |
|-------------------------|----------|

**Question 4**

| Question                      | Answers  | Mark                      | AO / Spec. Ref.           |         |  |  |  |  |  |       |  |         |  |   |              |
|-------------------------------|--|---------------------------|---------------------------|---------|--|--|--|--|--|-------|--|---------|--|---|--------------|
| 04.1                          | <table border="1"> <thead> <tr> <th>Group</th> <th>Classification for salmon</th> </tr> </thead> <tbody> <tr> <td>Kingdom</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Genus</td> <td></td> </tr> <tr> <td>Species</td> <td></td> </tr> </tbody> </table> | Group                     | Classification for salmon | Kingdom |  |  |  |  |  | Genus |  | Species |  | 1 | AO2<br>4.6.4 |
|                               | Group  | Classification for salmon |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               | Kingdom  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               | Genus  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
| Species                       |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  | 1                         |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  | 1                         |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
|                               |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |
| ignore upper case and italics |  |                           |                           |         |  |  |  |  |  |       |  |         |  |   |              |

| Question | Answers                         | Mark | AO / Spec. Ref. |
|----------|---------------------------------|------|-----------------|
| 04.2     | soya plants → salmon → sea lice | 1    | AO2<br>4.7.2.1  |

| Question | Answers                                  | Extra information | Mark | AO / Spec. Ref. |
|----------|--|-------------------|------|-----------------|
| 04.3     | the transfer of energy in the food chain |                   | 1    | AO1<br>4.7.2.1  |

| Question | Answers  | Extra information | Mark | AO / Spec. Ref. |
|----------|--|-------------------|------|-----------------|
| 04.4     | breed together the offspring that are most resistant to sea lice |                   | 1    | AO2<br>4.6.2.3  |

| Question | Answers                                      | Extra information | Mark | AO / Spec. Ref. |
|----------|--|-------------------|------|-----------------|
| 04.5     | when all offspring are resistant to sea lice |                   | 1    | AO2<br>4.6.2.3  |

| Question | Answers   | Extra information  | Mark | AO / Spec. Ref. |
|----------|---|--|------|-----------------|
| 04.6     | any <b>one</b> from: <ul style="list-style-type: none"> <li>• salmon grow larger</li> <li>• salmon grow faster</li> <li>• salmon need less food</li> <li>• salmon lose less energy</li> <li>• do not have to remove sea lice</li> <li>• no / less need for pesticides</li> <li>• not off-putting (to consumers / buyers)</li> <li>• (salmon) more likely to be sold / bought</li> <li>• salmon less likely to be damaged / infected</li> <li>• no / less need for antibiotics / medication</li> </ul> | allow converse for salmon that have sea lice if clearly stated<br><br>allow no / less need for insecticides<br><br>do <b>not</b> accept the idea of antibiotics / medication killing sea lice<br><br>ignore sea lice are not feeding on salmon unqualified | 1    | AO3<br>4.6.2.3  |

| Question | Answers  | Extra information | Mark | AO / Spec. Ref. |
|----------|--|-------------------|------|-----------------|
| 04.7     | all the salmon may suffer from the same diseases |                   | 1    | AO3<br>4.6.2.3  |

| Question | Answers  | Extra information  | Mark | AO / Spec. Ref. |
|----------|--|--|------|-----------------|
| 04.8     | <p>any <b>two</b> from:<br/>(GM salmon)</p> <ul style="list-style-type: none"> <li>• more profit(able) / cost-effective</li> <li>• cost less to feed</li> <li>• grow faster</li> <li>• do not need to be farmed / kept as long</li> <li>• feeds more people</li> </ul> | <p>answers must be comparative<br/>allow converse for non-GM salmon if clearly stated</p> <p>allow sell for more money / revenue</p> <p>ignore less food unqualified</p> <p>allow can be sold sooner<br/>allow sell twice as many (in 3 years)<br/>allow grow bigger (in 3 years)</p> <p>allow cheaper to buy salmon</p> <p>ignore reference to sea lice</p> | 2    | AO3<br>4.6.2.4  |

| Question | Answers   | Extra information | Mark | AO / Spec. Ref. |
|----------|---|-------------------|------|-----------------|
| 04.9     | to reduce the risk of GM salmon breeding with wild salmon |                   | 1    | AO3<br>4.6.2.4  |

|                         |           |
|-------------------------|-----------|
| <b>Total Question 4</b> | <b>12</b> |
|-------------------------|-----------|

**Question 5**

| Question | Answers   | Mark                       | AO / Spec. Ref. |
|----------|---|----------------------------|-----------------|
| 05.1     | <p>do <b>not</b> accept more than one line from a box on the left</p> | <p>1</p> <p>1</p> <p>1</p> | AO1<br>4.5.1    |

| Question | Answers  | Extra information | Mark              | AO / Spec. Ref. |
|----------|--|-------------------|-------------------|-----------------|
| 05.2     | <p>to allow cells to function properly</p> <p>to maintain the optimum conditions for enzymes</p> |                   | <p>1</p> <p>1</p> | AO1<br>4.5.1    |



| Question | Answers  | Extra information            | Mark | AO / Spec. Ref. |
|----------|--|------------------------------|------|-----------------|
| 05.3     | (body) temperature decreases<br>(with increasing time) | ignore decreases unqualified | 1    | AO2<br>4.5.1    |

| Question | Answers                   | Extra information                        | Mark | AO / Spec. Ref. |
|----------|---------------------------|--|------|-----------------|
| 05.4     | 37 – 35.5<br><br>1.5 (°C) | ignore minus sign<br><br>ignore decrease | 1    | AO2<br>4.5.1    |
|          |                           |  | 1    |                 |

| Question | Answers   | Extra information  | Mark | AO / Spec. Ref. |
|----------|---|--|------|-----------------|
| 05.5     | suitable extrapolation line on<br><b>Figure 6</b><br><br>answer consistent with student's<br>line | if no extrapolation allow value in<br>range 4.3 to 4.8<br><br>allow answer in minutes <b>or</b><br>hours and minutes if units are<br>given | 1    | AO2             |
|          |   |  | 1    | AO3<br>4.5.1    |

| Question | Answers  | Extra information | Mark | AO / Spec. Ref. |
|----------|----------|-------------------|------|-----------------|
| 05.6     | pancreas |                   | 1    | AO1<br>4.5.3.2  |

| Question | Answers            | Extra information | Mark | AO / Spec. Ref. |
|----------|--------------------|-------------------|------|-----------------|
| 05.7     | endocrine (system) |                   | 1    | AO1<br>4.5.3.1  |

| Question | Answers  | Extra information | Mark | AO / Spec. Ref. |
|----------|----------|-------------------|------|-----------------|
| 05.8     | decrease |                   | 1    | AO1<br>4.5.3.2  |

| Question | Answers              | Extra information   | Mark | AO / Spec. Ref. |
|----------|----------------------|---|------|-----------------|
| 05.9     | obesity / overweight | allow any <b>one</b> from: <ul style="list-style-type: none"><li>• lack of exercise</li><li>• inactivity</li><li>• family history (of diabetes)</li><li>• age</li><li>• high blood pressure</li><li>• high cholesterol</li><li>• race</li><li>• smoking</li><li>• high BMI</li><li>• diet high in carbohydrate / sugar / fat / salt</li></ul> | 1    | AO1<br>4.5.3.2  |

|                         |           |
|-------------------------|-----------|
| <b>Total Question 5</b> | <b>14</b> |
|-------------------------|-----------|

**Question 6**

| Question | Answers | Extra information       | Mark | AO / Spec. Ref.           |
|----------|---------|-------------------------|------|---------------------------|
| 06.1     | meiosis | allow phonetic spelling | 1    | AO1<br>4.6.1.1<br>4.6.1.2 |

| Question | Answers  | Extra information   | Mark | AO / Spec. Ref.           |
|----------|--|---|------|---------------------------|
| 06.2     | gametes / eggs / sperm are not (genetically) identical   | allow gametes / eggs / sperm are (genetically) different<br>allow cells produced by meiosis are not (genetically) identical   | 1    | AO1<br>4.6.1.1<br>4.6.1.2 |
|          | (there is) mixing of genetic information / genes / DNA<br><b>or</b><br>genetic information / genes / DNA from two / both parents | allow genetic information / genes / DNA from each parent<br>ignore gametes fuse unqualified<br><br>ignore two parents unqualified<br><br>if no other mark awarded allow <b>1</b> mark for mutations | 1    |                           |

| Question | Answers      | Extra information           | Mark | AO / Spec. Ref. |
|----------|--------------|-----------------------------|------|-----------------|
| 06.3     | heterozygous | ignore dominant / recessive | 1    | AO2<br>4.6.1.4  |

| Question    | Answers  | Extra information   | Mark | AO / Spec. Ref.           |
|-------------|--|---|------|---------------------------|
| <b>06.4</b> | (parents gamete genotypes shown)<br><b>D d</b> and <b>d d</b>          | allow in either position in Punnett square  | 1    | AO2                       |
|             | (possible offspring genotypes correctly derived)<br><b>Dd Dd dd dd</b> | allow correct derivation of offspring genotypes from incorrect gametes<br>allow 3 correct offspring genotypes for <b>1</b> mark                                     | 2    | AO2                       |
|             | correct identification of <b>Dd</b> offspring as having polydactyly    | if derivation not correct and shows <b>DD</b> and <b>Dd</b> , both must be identified as having polydactyly   | 1    | AO2                       |
|             | probability must match derived offspring genotypes                     | if no derivation shown allow 0.5<br><b>or 50% or 1 in 2 or 1:1 or ½</b><br>do <b>not</b> accept 1:2<br>allow correct probability from incorrectly derived offspring | 1    | AO3<br>4.6.1.4<br>4.6.1.5 |

| Question           | Answers  | Extra information  | Mark     | AO / Spec. Ref.        |
|--------------------|--|--|----------|------------------------|
| <p><b>06.5</b></p> | <p>any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• can find out if the embryo has an (inherited) disorder</li> <li>• can prepare for baby (with the disorder)</li> <li>• can decide whether to continue with the pregnancy</li> <li>• fewer people with (inherited) disorders over time</li> </ul> | <p>allow can find out if the embryo has inherited disease<br/>ignore can find out if the embryo has disease(s)</p> <p>allow description of preparation for the baby eg access to early treatment</p> <p>allow choice of (in vitro) embryos (to be implanted)</p> | <p>2</p> | <p>AO3<br/>4.6.1.5</p> |

|                         |           |
|-------------------------|-----------|
| <b>Total Question 6</b> | <b>11</b> |
|-------------------------|-----------|

## Question 7

| Question | Answers   | Extra information | Mark | AO / Spec. Ref.           |
|----------|---|-------------------|------|---------------------------|
| 07.1     | humans have not found evidence of every species |                   | 1    | AO3<br>4.6.3.2<br>4.6.3.3 |

| Question | Answers | Extra information   | Mark | AO / Spec. Ref.                      |
|----------|---------|---|------|--------------------------------------|
| 07.2     | fossils | allow fossil record<br>allow remains of organisms<br>allow DNA<br>do <b>not</b> accept fossil fuels | 1    | AO1<br>4.6.3.1<br>4.6.3.2<br>4.6.3.3 |

| Question                | Answers  | Mark | AO / Spec. Ref.               |
|-------------------------|--|------|-------------------------------|
| 07.3                    | <b>Level 3:</b> Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.   | 5–6  | AO2                           |
|                         | <b>Level 2:</b> Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.  | 3–4  | AO2                           |
|                         | <b>Level 1:</b> Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.  | 1–2  | AO1                           |
|                         | <b>No relevant content</b>   | 0    |                               |
|                         | <b>Indicative content</b><br><b>Methods of reducing rate of evolution and linked explanation</b> <ul style="list-style-type: none"> <li>• doctors should not prescribe antibiotics inappropriately                             <ul style="list-style-type: none"> <li>○ so fewer <i>C. difficile</i> are exposed to antibiotic(s)</li> </ul> </li> <li>• do not use antibiotics to treat mild (bacterial) infection                             <ul style="list-style-type: none"> <li>○ because the immune system can respond (to mild bacterial infection)</li> </ul> </li> <li>• do not use antibiotics to treat (any) viral infections                             <ul style="list-style-type: none"> <li>○ because antibiotics do not kill viruses</li> </ul> </li> <li>• patients should complete their course of antibiotics                             <ul style="list-style-type: none"> <li>○ so (more likely that) all <i>C. difficile</i> are killed</li> <li>○ so none survive to mutate (and form resistant strains)</li> </ul> </li> <li>• the agricultural use of antibiotics should be restricted                             <ul style="list-style-type: none"> <li>○ so fewer <i>C. difficile</i> are exposed to antibiotic(s)</li> </ul> </li> <li>• hand washing after going to toilet                             <ul style="list-style-type: none"> <li>○ will reduce spread of <i>C. difficile</i></li> </ul> </li> <li>• people with diarrhoea / <i>C. difficile</i> should stay away from school / work                             <ul style="list-style-type: none"> <li>○ to reduce spread of <i>C. difficile</i></li> </ul> </li> <li>• develop new antibiotic against <i>C. difficile</i> <ul style="list-style-type: none"> <li>○ so all <i>C. difficile</i> are killed</li> <li>○ so none survive to mutate and form (another) resistant strain</li> </ul> </li> <li>• develop vaccine against <i>C. difficile</i> <ul style="list-style-type: none"> <li>○ would decrease the use of antibiotics</li> </ul> </li> </ul> <p>For <b>Level 3</b>, answers must refer to method(s) and linked explanation(s).</p> |      | 4.6.3.4<br>4.6.3.1<br>4.6.2.2 |
| <b>Total Question 7</b> | <b>8</b>   |      |                               |