



**GCSE**

**Biology A**

Unit **A163/01**: Module B7 (Foundation Tier)

General Certificate of Secondary Education

**Mark Scheme for June 2016**

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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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## Annotations

Used in the detailed Mark Scheme:

| Annotation   | Meaning                                                       |
|--------------|---------------------------------------------------------------|
| /            | 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                                           |

Available in RM Assessor to annotate scripts

|                                                                                     |                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------|
|    | indicate uncertainty or ambiguity                         |
|    | benefit of doubt                                          |
|    | contradiction                                             |
|   | incorrect response                                        |
|  | error carried forward                                     |
|  | draw attention to particular part of candidate's response |
|  | draw attention to particular part of candidate's response |
|  | draw attention to particular part of candidate's response |
|  | no benefit of doubt                                       |

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|                                                                                   |                                                           |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------|
|  | reject                                                    |
|  | correct response                                          |
|  | draw attention to particular part of candidate's response |
|  | information omitted                                       |

### Subject-specific Marking Instructions

- If a candidate alters his/her response, examiners should accept the alteration.
- 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.

|   |
|---|
|   |
|   |
| ✗ |
| ✗ |
|   |

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

|   |
|---|
|   |
|   |
| ✓ |
| ✗ |
|   |

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

|   |
|---|
| ✗ |
| ✗ |
| ✓ |
| ✓ |
|   |

This would be worth 1 mark.

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- c. 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.
- d. 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> |

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## MARK SCHEME:

| Question |   |  | CBT<br>Question<br>Numbers                                                                                               | Answer                                                                                                                                                                                                                                                               |                                                                                        |                             | Mark | Guidance |
|----------|---|--|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------|------|----------|
| 1        | a |  |                                                                                                                          | digestion                                                                                                                                                                                                                                                            |                                                                                        |                             | 2    |          |
|          |   |  |                                                                                                                          | nerve transmission                                                                                                                                                                                                                                                   |                                                                                        |                             |      |          |
|          |   |  |                                                                                                                          | support the body                                                                                                                                                                                                                                                     | ✓                                                                                      |                             |      |          |
|          |   |  |                                                                                                                          | control of body temperature                                                                                                                                                                                                                                          |                                                                                        |                             |      |          |
|          |   |  |                                                                                                                          | movement                                                                                                                                                                                                                                                             | ✓                                                                                      |                             |      |          |
|          | b |  |                                                                                                                          | <div><div>cartilage</div><div>tendon</div><div>ligament</div></div> <div><div>transmits forces<br/>between muscle and<br/>bone</div><div>holds joints together</div><div>reduces friction</div></div> <div><div>elastic</div><div>tough</div><div>smooth</div></div> | 3                                                                                      | 1 mark for each correct row |      |          |
| c        |   |  | Sprain;<br>Dislocation<br>Torn or damaged ligament / tendon;                                                             | 2                                                                                                                                                                                                                                                                    | 3 correct = 2<br>2 correct = 1<br><br><b>ignore</b> any references to bone / fractures |                             |      |          |
| d        |   |  | Assessment / advice / instructions;<br>Exercises;<br>Idea of cure (e.g. strengthen muscles) /<br>improvement / recovery; | 3                                                                                                                                                                                                                                                                    | <b>ignore</b> physiotherapy<br><b>accept</b> massage                                   |                             |      |          |
|          |   |  |                                                                                                                          | Total                                                                                                                                                                                                                                                                |                                                                                        |                             | 10   |          |

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| Question |  |  | CBT<br>Question<br>Numbers | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Mark     | Guidance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|--|--|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2        |  |  | ✓                          | <p><b>[Level 3]</b><br/>Includes some indicatives points from all three areas.<br/>Quality of written communication does not impede communication of the science at this level.<br/>(5 – 6 marks)</p> <p><b>[Level 2]</b><br/>Includes some indicative points from two areas.<br/>Quality of written communication partly impedes communication of the science at this level.<br/>(3 – 4 marks)</p> <p><b>[Level 1]</b><br/>Includes some indicative points from one area.<br/>Quality of written communication impedes communication of the science at this level.<br/>(1 – 2 marks)</p> <p><b>[Level 0]</b><br/>Insufficient or irrelevant science. Answer not worthy of credit.<br/>(0 marks)</p> | 6        | <p><b>This question is targeted at grades up to C</b></p> <p><b>Indicative scientific points referring to the <b>tables</b> may include:</b></p> <ul style="list-style-type: none"> <li>• BMI = 90 / 2.89</li> <li>• = 31</li> <li>• Needs to be 24 or below</li> <li>• Refers to 29% fat</li> </ul> <p><b>Indicative scientific points concerning <b>conclusions</b></b></p> <ul style="list-style-type: none"> <li>• Neil is obese on BMI scale</li> <li>• Neil is above average on fat scale</li> <li>• Idea that BMI is not completely reliable</li> </ul> <p><b>Indicative scientific points for <b>action</b> may include:</b></p> <ul style="list-style-type: none"> <li>• Yes he should be concerned.</li> <li>• He should lose weight</li> <li>• Do more exercise</li> <li>• Improved diet</li> </ul> <p><b>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</b></p> |
|          |  |  |                            | <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>6</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| Question |   |  | CBT<br>Question<br>Numbers | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Mark | Guidance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------|---|--|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3        | a |  |                            | <p><b>[Level 3]</b><br/>Answer includes some indicative scientific points concerning BOTH group 1 and group 2 AND refers to difficulties regarding overlap of groups.<br/>Quality of written communication does not impede communication of the science at this level.<br/>(5 – 6 marks)</p> <p><b>[Level 2]</b><br/>Answer includes some indicative scientific points concerning BOTH group 1 and group 2.<br/>Quality of written communication partly impedes communication of the science at this level.<br/>(3 – 4 marks)</p> <p><b>[Level 1]</b><br/>Answer includes some correct indicative points concerning group 1 OR group 2.<br/>Quality of written communication impedes communication of the science at this level.<br/>(1 – 2 marks)</p> <p><b>[Level 0]</b><br/>Insufficient or irrelevant science. Answer not worthy of credit.<br/>(0 marks)</p> | 6    | <p><b>This question is targeted at grades up to C</b><br/><b>References to indicative scientific points concerning group 1 may include:</b></p> <ul style="list-style-type: none"> <li>• Some men have a very healthy aorta</li> <li>• Some have an aneurism that may require surgery.</li> <li>• Reasons for not giving surgery could include ideas of benefits do not outweigh the risk of surgery.</li> <li>• Range in group 1 is 1.0 – 6.5cm</li> </ul> <p><b>References to indicative scientific points concerning group 2 may include</b></p> <ul style="list-style-type: none"> <li>• All men in group have an aneurism</li> <li>• Surgery starts at about 4.5cm</li> <li>• Range in group 2 is 4.5 – 8.5cm</li> </ul> <p><b>References to indicative scientific points concerning overlap of both groups may include:</b></p> <ul style="list-style-type: none"> <li>• Idea of some men have surgery between 4.5cm and 6.5cm (group 2) others do not (group 1).</li> <li>• All men 6.5cm and above have surgery</li> <li>• Idea that they may have different risk factors e.g. BMI / smokers etc.</li> </ul> <p><b>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</b></p> |

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| Question |   |     | CBT<br>Question<br>Numbers | Answer                                                                                                                                    | Mark      | Guidance                                                                                 |
|----------|---|-----|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------|
| 3        | b | i   |                            | Pacemaker;<br>Heart valve;<br>Organ printing;                                                                                             | 2         | any 2 from 3<br><b>ignore</b> bypass / transplant                                        |
|          |   | ii  |                            | <i>Any three from:</i><br>Death;<br>Bleeding;<br>Pain;<br>Infection;<br>Rejection;<br>Reaction to anaesthetic;<br>Mistake by doctor;      | 3         | <b>accept</b> any good alternative<br><b>ignore</b> failure of surgery / it may not work |
|          |   | iii |                            | <i>Any two from:</i><br>Only do op if necessary;<br><b>Anti-rejection</b> drugs;<br>Check for allergic reaction;<br>Well trained doctors; | 2         |                                                                                          |
|          |   |     |                            | <b>Total</b>                                                                                                                              | <b>13</b> |                                                                                          |

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| Question |   |     | CBT<br>Question<br>Numbers | Answer                                                                                                                                                                                                                                                                                                      | Mark | Guidance                                                                                                                                                                                  |
|----------|---|-----|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4        | a | i   | ✓                          | Less than / before 30;<br>(age) when stopped smoking;                                                                                                                                                                                                                                                       | 2    | <b>Do not accept</b> 30 (and under)                                                                                                                                                       |
|          |   | ii  | ✓                          | 11 – 5.6;<br>5.4;                                                                                                                                                                                                                                                                                           | 2    | 5.4 alone = 2 marks                                                                                                                                                                       |
|          |   | iii | ✓                          | <i>Any two from:</i><br>The <b>younger</b> you are when you <b>stop</b> the lower the risk / the <b>older</b> you are when you <b>stop</b> the higher the risk;<br>Even if never smoked still have a risk / low(est) risk;<br><b>Rate</b> of increase of risk increases with age / doubles every ten years; | 2    | <b>accept</b> positive correlation between age and risk for 1 mark                                                                                                                        |
|          |   | iv  | ✓                          | (As) <b>how long</b> they have smoked....;<br><br>.....increases, risk increases;;                                                                                                                                                                                                                          | 2    | <b>accept</b> idea that it is uncertain how long they have been smoking.<br><br>Trend must be identified for 2 <sup>nd</sup> mark e.g. Longer you smoke the bigger the risk ORA = 2 marks |
|          | b |     | ✓                          | <b>Food / intake idea</b> eg Poor diet explained eg fat clogs arteries;<br><b>Exercise idea</b> eg Lack of exercise explained eg unfit ORA;                                                                                                                                                                 | 2    | <b>accept</b> recreational / illegal drugs and alcohol for Food idea<br><b>accept</b> any good explanation e.g. fat clogs arteries / salt raises blood pressure                           |
|          |   |     |                            | <b>Total</b>                                                                                                                                                                                                                                                                                                |      |                                                                                                                                                                                           |

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| Question |   |  | CBT<br>Question<br>Numbers | Answer                                                                        | Mark     | Guidance                                                                                                                                      |
|----------|---|--|----------------------------|-------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 5        | a |  |                            | Never runs out;                                                               | 1        | <b>ignore</b> reusable <b>accept</b> always there                                                                                             |
|          |   |  |                            | Idea qualified eg can't use it up like coal;<br>External source of energy;    | 1        |                                                                                                                                               |
|          | b |  |                            | Goes <b>open</b> loop;<br>Has an effect on food web / other organisms;        | 2        |                                                                                                                                               |
|          | c |  |                            | Farmers – more meat;<br><br>Rest of world – less resources / O <sub>2</sub> ; | 2        | Examples could include native people, indigenous groups with a loss of habitat / homes / resources<br>Scientists, medicines/cures from plants |
|          |   |  |                            | <b>Total</b>                                                                  | <b>6</b> |                                                                                                                                               |

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| Question |   |  | CBT<br>Question<br>Numbers | Answer                                                                                             | Mark     | Guidance                                        |
|----------|---|--|----------------------------|----------------------------------------------------------------------------------------------------|----------|-------------------------------------------------|
| 6        | a |  |                            | Increase;<br><br>Decrease / Reduce;                                                                | 2        | <b>accept</b> cools down                        |
|          | b |  |                            | <i>Any two from:</i><br>Dehydration;<br>Reduced sweating;<br>Increase in body temp / hyperthermia; | 2        |                                                 |
|          | c |  |                            |                                                                                                    | 2        | 3 lines correct = 2<br>1 or 2 lines correct = 1 |
|          |   |  |                            | <b>Total</b>                                                                                       | <b>6</b> |                                                 |

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| Question |   |    | CBT<br>Question<br>Numbers | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mark | Guidance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|---|----|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7        | a | i  |                            | Enzymes;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|          |   | ii |                            | (Uses) Chymosin;<br>Idea of not from animal ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2    | <b>accept</b> does not use rennet / enzyme from animals<br><b>do not accept</b> ideas about milk not coming from animals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|          | b |    |                            | <p><b>[Level 3]</b><br/>Some details of industrial process.<br/>AND<br/>Some details of features.<br/>Quality of written communication does not impede communication of the science at this level.<br/>(5 – 6 marks)</p> <p><b>[Level 2]</b><br/>Some details of industrial process.<br/>OR<br/>Some details of features.<br/>OR<br/>One detail of both.<br/>Quality of written communication partly impedes communication of the science at this level.<br/>(3 – 4 marks)</p> <p><b>[Level 1]</b><br/>One detail of industrial process or one detail of features.<br/>OR<br/>One detail of the use of data<br/>Quality of written communication impedes communication of the science at this level.<br/>(1 – 2 marks)</p> <p><b>[Level 0]</b><br/>Insufficient or irrelevant science. Answer not worthy of credit.</p> |      | <p><b>This question is targeted at grades up to E</b></p> <p><b>Indicative scientific points regarding industrial process may include:</b></p> <ul style="list-style-type: none"> <li>• fermentation</li> <li>• does not take up much space</li> <li>• make a lot</li> <li>• controlled conditions</li> <li>• no ethical concerns</li> <li>• named products eg antibiotics / single cell protein</li> </ul> <p><b>Indicative scientific points regarding features of bacteria may include:</b></p> <ul style="list-style-type: none"> <li>• can be genetically modified</li> <li>• idea of how genetically modified</li> <li>• presence of plasmids</li> <li>• rapid reproduction / doubles</li> <li>• simple biochemistry</li> <li>• can make complex molecules</li> </ul> <p><b>Indicative scientific points regarding use of data may include:</b></p> <ul style="list-style-type: none"> <li>• correct reference to time and number of bacteria</li> </ul> |

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|----------|--|--|----------------------------|-------------|------|---------------------------------------------------------------------|
|          |  |  |                            | (0 marks)   |      | Use the L1, L2, L3 annotations in RM Assessor;<br>do not use ticks. |
|          |  |  |                            | Total       | 9    |                                                                     |
|          |  |  |                            | Paper Total | 60   |                                                                     |

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**Education and Learning**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

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**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

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