# Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE

In Biology (5BI1F) Paper 01

**Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

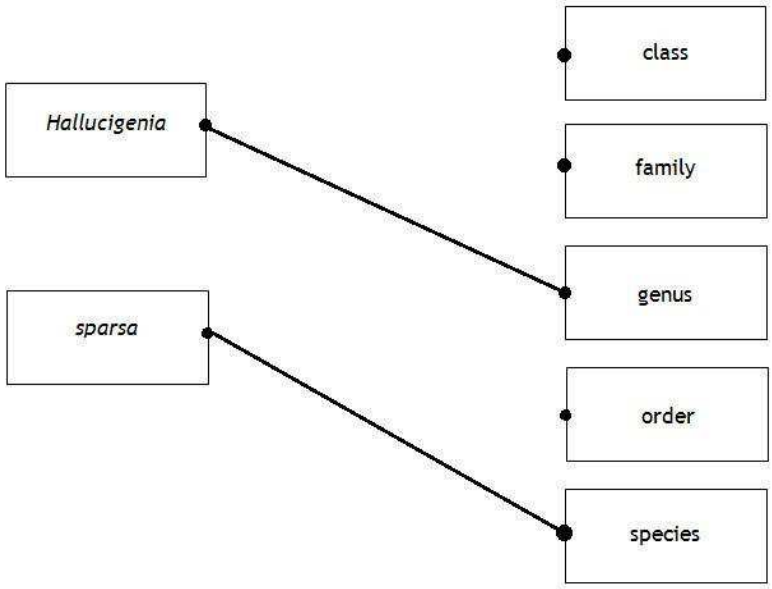
**Pearson: helping people progress, everywhere**

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2017
Publications Code 5BI1F_01_1706_MS

## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

| Question number | Answer | Marks |
|---|---|---|
| 1 (a) (i) | **binomial name** **classification**<br>  <br><br>reject more than one line from a binomial name | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 1 (a) (ii) | **A** Animalia<br>**The only correct answer is A**<br>***B** is not correct because Fungi do not eat other organisms*<br>***C** is not correct because Plantae do not eat other organisms*<br>***D** is not correct because Protoctista do not eat other organisms* | (1) |

| Question number | Answer | Marks |
|---|---|---|
| 1 (b) (i) | **B** a heterotroph<br><br>**The only correct answer is B**<br><br>***A*** *is not correct because an autotroph produces its own food*<br><br>***C*** *is not correct because homeotherm is an organism that generates their own body heat and this word is not a feeding mechanism*<br><br>***D*** *is not correct because a poikilotherm is an organism that uses external sources for body heat and this word is not a feeding mechanism* | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 1 (b) (ii) | (head) made of soft tissue / decayed / heads were eaten (1) | accept fossil was damaged / head rotted / head decomposed | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 1 (c) | A description including three of the following:<br><br>• organisms may be less well <u>adapted</u> (to a changing climate) (1)<br><br>• so they are outcompeted by other organisms (1)<br><br>• harder to find food / shelter (1)<br><br>• do not live long enough to reproduce / less successful reproduction (1) | cannot <u>adapt</u><br><br>description of named<br><br>resources / habitat destroyed<br><br>not able to reproduce | (3) |

**Total for question 1 = 8 marks**

| Question number | Answer | Marks |
|---|---|---|
| 2 (a) (i) | **B** mutualism<br><br>**The only correct answer is B**<br><br>***A** is not correct because geotropism is a plant response and is not a feeding relationship*<br><br>***C** is not correct because oviparous is an organism that produces eggs that mature and hatch after being expelled from the body and is not classed as a feeding relationship*<br><br>***D** is not correct because viviparous is an organism bring forth live young which have developed inside the body of the parent and is not classed as a feeding relationship* | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 2 (a) (ii) | A description to include the following:<br><br>• oxpecker benefits by eating (parasitic) insects from (the skin of) the antelope (1)<br><br>• the antelope does not become infected (by the parasitic insects that are removed) (1) | accept any named example of insect / bugs<br><br>accept does not have blood sucked | (2) |

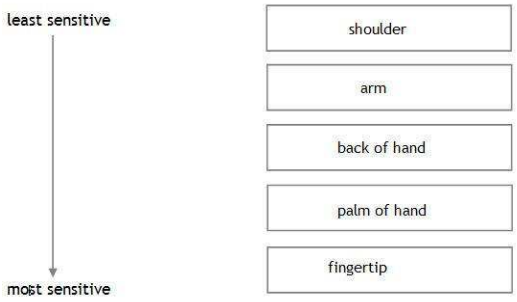
| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 2 (b) (i) | parasitism | parasitic | (1) |

| Question number | Answer | Marks |
|---|---|---|
| 2 (b) (ii) | **B** head lice<br><br>**The only correct answer is B**<br><br>***A** is not correct because lichen do not suck blood from a host*<br><br>***C** is not correct because houseflies do not suck blood from a host*<br><br>***D** is not correct because mistletoe does not suck blood from a host* | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 2 (c) | A description including three of the following:<br><br>• attaches to the inside / lives inside (the host) / intestine (1)<br><br>• using hooks / suckers (1)<br><br>• absorbing (digested) food from their host (1)<br><br>• lays eggs which leave host in faeces (to infect other organisms) (1) | allow nutrients | (3) |

**Total for question 2 = 8 marks**

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 3 (a) | not too sharp / do not press too hard | Accept do not use on broken or inflamed skin / check for allergic reactions to metal<br><br>Accept disinfected / cleaned | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 3 (b) (i) |  | two marks for correct order<br><br>One mark for correct interpretation of the graph, i.e. correct answer but in reverse order(fingertip → palm of hand → back of hand → arm → shoulder)<br><br>If fingertip and shoulder in correct place then give 1 mark | (2) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 3 (b) (ii) | A suggestion including the following linked together:<br><br>• most sensitive on the palm of the hand / react faster (1)<br><br>• because the palm of the hand is used for touching / hot things (1) | Contact with danger / prevent damage from the environment<br><br>accept reverse argument for the back of the hand | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 3 (c) | **D** sensory neurons<br><br>**The only correct answer is D**<br><br>***A** is not correct because motor neurones pass impulses from the CNS to effectors*<br><br>***B** is not correct because relay neurones are found in the spinal cord between sensory and motor neurones.*<br><br>***C** is not correct because a reflex neurone is another name for a relay neurone and these are found in the spinal cord between sensory and motor neurones.* | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 3 (d) | Explanation to include:<br><br>• rapid / fast response (1)<br><br>• to limit damage / get away from danger (1) | Immediate / without thinking | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 3 (e) | A description linking the following:<br><br>• neurotransmitters / chemical signals (1)<br>• (are passed across) the synapse (1) | (2) |

**Total for question 3 = 10 marks**

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 4a (i) | 1263 (+) 98 (+) 1422 (1)<br><br>= 2783 | 2 marks for correct answer with no working | (2) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 4 (a) (ii) | A suggestion to include the following:<br><br>• more houses in Southwark / more people in Southwark / overcrowding in Southwark (1)<br><br>• cleaner water supply in Lambeth / better sanitation (1) | accept reverse argument | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 4 (a) (iii) | bacteria (1) | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 4 (b) (i) | A description including three of the following:<br><br>• skin as a barrier (1)<br><br>• mucus traps pathogens (1)<br><br>• cilia sweep pathogens (back up the trachea) / moves mucus (1) | does not let bacteria in<br><br>NOT trap<br><br>accept scab / blood clot provides a barrier (1) | (3) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 4 (b) (ii) | An description including the following linked together:<br><br>• (hydrochloric) stomach acid (1)<br><br>OR<br><br>• lysozymes in tears (1)<br><br>AND<br>• kills pathogens / bacteria / microorganism (1) | Not infection / disease | (2) |

**Total for question 4 = 10 marks**

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 5 (a) (i) | maize (plants) → locusts → lizards → snakes<br><br>If correct order in boxes, but no arrows (1) | If correct order, but in reverse, showing arrows also reversed (Right to Left) then award 2 marks. | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 5 (a) (ii) | **D** sunlight<br><br>**The only correct answer is D**<br><br>***A** is not correct because maize plant do not get energy from the locust*<br><br>***B** is not correct because maize plants obtain carbon dioxide from the air*<br><br>***C** is not correct because maize plants obtain minerals and water from the soil* | (1) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 5 (b) (i) | 8800 ÷ 100 = 88 (1)<br><br>88 x 8 = 704 (g) | Accept alternative methods of calculating percentages 2 marks for correct answer no working | (2) |

| Question number | Answer | Marks |
|---|---|---|
| 5 (b) (ii) | not all of the plant is eaten / not all can be digested | (1) |

| Question Number | | Indicative Content | Mark |
|---|---|---|---|
| **QWC** | ***5c** | A explanation to include some of the following points<br><br>• the atmosphere contains carbon dioxide ($CO_2$)<br><br>Photosynthesis<br>• plants take in $CO_2$ during photosynthesis<br>• Plants make carbon compounds from $CO_2$<br><br>Respiration<br>• plants release $CO_2$ during respiration<br>• plants are eaten by animals<br>• carbon is passed from organism to organism<br>• animals release $CO_2$ during respiration<br><br>Decomposition<br>• microorganisms feed on dead plant and animal matter<br>• microorganisms release $CO_2$ during respiration or decomposition<br><br>Combustion<br>• fossil fuels are formed from dead plants and animals<br>• fossil fuels contain stored carbon<br>• $CO_2$ is released when fossil fuels are combusted | **(6)** |
| **Level** | **0** | No rewardable content | |
| **1** | **1 - 2** | • A limited explanation of at least one process of the carbon cycle<br>• the answer communicates ideas using simple language and uses limited scientific terminology<br>• spelling, punctuation and grammar are used with limited accuracy | |
| **2** | **3 - 4** | • A simple explanation of at least two processes of the carbon cycle or a detailed explanation of one process of the carbon cycle including some reference to carbon dioxide<br>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately<br>• spelling, punctuation and grammar are used with some accuracy | |
| **3** | **5 - 6** | • A detailed explanation of at least three of the processes of the carbon cycle including some reference to carbon dioxide<br>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately<br>• spelling, punctuation and grammar are used with few errors | |

**Total for question 5 = 12 marks**

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 6 (a) (i) | 42 (-) 6.9 (1)<br><br>= 35 / 35.1 / 35.2 | Accept numbers in the range of 6.8 - 7<br><br>2 marks for correct answer no working | (2) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 6 (a) (ii) | A suggestion to include two of the following:<br><br>• (likely to be) obese (1)<br><br>• likely to have a high fat diet / high sugar diet (1)<br><br>• likely to have a sedentary lifestyle (1) | not overweight or fat<br><br>do not accept examples<br><br>lack of exercise | (2) |

| Question number | Answer | Acceptable answers | Marks |
|---|---|---|---|
| 6 (a) (iii) | A description to include the following:<br><br>• <u>resistant</u> (1)<br><br>• (to) <u>insulin</u> (1) | ignore immune<br><br>only accept the insulin mark if it is in the context of resistance / unresponsive | (2) |

| Question Number | | Indicative Content | Mark |
|---|---|---|---|
| **QWC** | ***6b** | A description to include some of the following points<br><br>People with type 1 diabetes:<br>• insulin injections<br>• into subcutaneous fat layer<br>• easily absorbed into the bloodstream<br>• level of physical activity affects level of insulin required<br>• careful control of carbohydrate diet<br><br>People with type 2 diabetes:<br>• glucose not absorbed into body cells such as the liver / muscles<br>• exercise regularly<br>• careful control of carbohydrate diet<br>• medication (such as Acarbose or Metformin) to reduce glucose in the blood after a meal | **(6)** |
| **Level** | **0** | No rewardable content | |
| **1** | **1 - 2** | • A limited description of how diabetes is controlled.<br>• the answer communicates ideas using simple language and uses limited scientific terminology<br>• spelling, punctuation and grammar are used with limited accuracy | |
| **2** | **3 - 4** | • A simple description of how type 1 **and** type 2 diabetes are controlled or a detailed description of one type of diabetes.<br>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately<br>• spelling, punctuation and grammar are used with some accuracy | |
| **3** | **5 - 6** | • A detailed description of how type 1 **and** type 2 diabetes are controlled including a reference to insulin injections into fat layer and carbohydrate diet control.<br>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately<br>• spelling, punctuation and grammar are used with few errors | |

**Total for question 6 = 12 marks**

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom