



Pearson

Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE

In Biology (5BI1F) Paper 01

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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)	<p>binomial name</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <div data-bbox="405 450 608 544" style="border: 1px solid black; padding: 5px; margin-bottom: 20px;"><i>Hallucigenia</i></div> <div data-bbox="405 656 608 750" style="border: 1px solid black; padding: 5px;"><i>sparsa</i></div> </div> <div style="text-align: center;"> <p>classification</p> <div data-bbox="967 371 1169 465" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">class</div> <div data-bbox="967 495 1169 589" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">family</div> <div data-bbox="967 618 1169 712" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">genus</div> <div data-bbox="967 741 1169 835" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">order</div> <div data-bbox="967 864 1169 958" style="border: 1px solid black; padding: 5px;">species</div> </div> </div> <p>reject more than one line from a binomial name</p>	(2)

Question number	Answer	Marks
1 (a) (ii)	<p>A Animalia</p> <p>The only correct answer is A</p> <p><i>B is not correct because Fungi do not eat other organisms</i></p> <p><i>C is not correct because Plantae do not eat other organisms</i></p> <p><i>D is not correct because Protocista do not eat other organisms</i></p>	(1)

Question number	Answer	Marks
1 (b) (i)	<p>B a heterotroph</p> <p>The only correct answer is B</p> <p><i>A is not correct because an autotroph produces its own food</i></p> <p><i>C is not correct because homeotherm is an organism that generates their own body heat and this word is not a feeding mechanism</i></p> <p><i>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</i></p>	(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)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • organisms may be less well <u>adapted</u> (to a changing climate) (1) • so they are outcompeted by other organisms (1) • harder to find food / shelter (1) • do not live long enough to reproduce / less successful reproduction (1) 	<p>cannot <u>adapt</u></p> <p>description of named resources / habitat destroyed</p> <p>not able to reproduce</p>	(3)

Total for question 1 = 8 marks

Question number	Answer	Marks
2 (a) (i)	<p>B mutualism</p> <p>The only correct answer is B</p> <p><i>A is not correct because geotropism is a plant response and is not a feeding relationship</i></p> <p><i>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</i></p> <p><i>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</i></p>	(1)

Question number	Answer	Acceptable answers	Marks
2 (a) (ii)	<p>A description to include the following:</p> <ul style="list-style-type: none"> • oxpecker benefits by eating (parasitic) insects from (the skin of) the antelope (1) • the antelope does not become infected (by the parasitic insects that are removed) (1) 	<p>accept any named example of insect / bugs</p> <p>accept does not have blood sucked</p>	(2)


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

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

Question number	Answer	Acceptable answers	Marks
2 (c)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • attaches to the inside / lives inside (the host) / intestine (1) • using hooks / suckers (1) • absorbing (digested) food from their host (1) • 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 Accept disinfected / cleaned	(1)

Question number	Answer	Acceptable answers	Marks
3 (b) (i)	<p>least sensitive</p>  <p>most sensitive</p> <div style="display: flex; flex-direction: column; align-items: center; gap: 5px;"> <div style="border: 1px solid black; padding: 2px 10px;">shoulder</div> <div style="border: 1px solid black; padding: 2px 10px;">arm</div> <div style="border: 1px solid black; padding: 2px 10px;">back of hand</div> <div style="border: 1px solid black; padding: 2px 10px;">palm of hand</div> <div style="border: 1px solid black; padding: 2px 10px;">fingertip</div> </div>	<p>two marks for correct order</p> <p>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)</p> <p>If fingertip and shoulder in correct place then give 1 mark</p>	(2)

Question number	Answer	Acceptable answers	Marks
3 (b) (ii)	<p>A suggestion including the following linked together:</p> <ul style="list-style-type: none"> • most sensitive on the palm of the hand / react faster (1) • because the palm of the hand is used for touching / hot things (1) 	<p>Contact with danger / prevent damage from the environment</p> <p>accept reverse argument for the back of the hand</p>	(2)

Question number	Answer	Marks
3 (c)	<p>D sensory neurons</p> <p>The only correct answer is D</p> <p><i>A is not correct because motor neurones pass impulses from the CNS to effectors</i></p> <p><i>B is not correct because relay neurones are found in the spinal cord between sensory and motor neurones.</i></p> <p><i>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.</i></p>	(1)

Question number	Answer	Acceptable answers	Marks
3 (d)	<p>Explanation to include:</p> <ul style="list-style-type: none"> • rapid / fast response (1) • to limit damage / get away from danger (1) 	Immediate / without thinking	(2)

Question number	Answer	Marks
3 (e)	<p>A description linking the following:</p> <ul style="list-style-type: none"> • neurotransmitters / chemical signals (1) • (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) = 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: <ul style="list-style-type: none"> • more houses in Southwark / more people in Southwark / overcrowding in Southwark (1) • 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)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • skin as a barrier (1) • mucus traps pathogens (1) • cilia sweep pathogens (back up the trachea) / moves mucus (1) 	<p>does not let bacteria in</p> <p>NOT trap</p> <p>accept scab / blood clot provides a barrier (1)</p>	(3)

Question number	Answer	Acceptable answers	Marks
4 (b) (ii)	<p>An description including the following linked together:</p> <ul style="list-style-type: none"> • (hydrochloric) stomach acid (1) <p>OR</p> <ul style="list-style-type: none"> • lysozymes in tears (1) <p>AND</p> <ul style="list-style-type: none"> • kills pathogens / bacteria / microorganism (1) 	<p>Not infection / disease</p>	(2)

Total for question 4 = 10 marks

Question number	Answer	Acceptable answers	Marks
5 (a) (i)	maize (plants) → locusts → lizards → snakes 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 The only correct answer is D <i>A is not correct because maize plant do not get energy from the locust</i> <i>B is not correct because maize plants obtain carbon dioxide from the air</i> <i>C is not correct because maize plants obtain minerals and water from the soil</i>	(1)

Question number	Answer	Acceptable answers	Marks
5 (b) (i)	$8800 \div 100 = 88$ (1) $88 \times 8 = 704$ (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	<p>A explanation to include some of the following points</p> <ul style="list-style-type: none"> the atmosphere contains carbon dioxide (CO₂) <p>Photosynthesis</p> <ul style="list-style-type: none"> plants take in CO₂ during photosynthesis Plants make carbon compounds from CO₂ <p>Respiration</p> <ul style="list-style-type: none"> plants release CO₂ during respiration plants are eaten by animals carbon is passed from organism to organism animals release CO₂ during respiration <p>Decomposition</p> <ul style="list-style-type: none"> microorganisms feed on dead plant and animal matter microorganisms release CO₂ during respiration or decomposition <p>Combustion</p> <ul style="list-style-type: none"> fossil fuels are formed from dead plants and animals fossil fuels contain stored carbon CO₂ is released when fossil fuels are combusted 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> A limited explanation of at least one process of the carbon cycle the answer communicates ideas using simple language and uses limited scientific terminology spelling, punctuation and grammar are used with limited accuracy 	
2	3 - 4	<ul style="list-style-type: none"> 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 the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately spelling, punctuation and grammar are used with some accuracy 	
3	5 - 6	<ul style="list-style-type: none"> A detailed explanation of at least three of the processes of the carbon cycle including some reference to carbon dioxide the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately spelling, punctuation and grammar are used with few errors 	

Total for question 5 = 12 marks

Question number	Answer	Acceptable answers	Marks
6 (a) (i)	$42 \div 6.9 = 6.07$ $= 35 \div 35.1 \div 35.2$	Accept numbers in the range of 6.8 - 7 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: <ul style="list-style-type: none"> • (likely to be) obese (1) • likely to have a high fat diet / high sugar diet (1) • likely to have a sedentary lifestyle (1) 	not overweight or fat do not accept examples lack of exercise	(2)

Question number	Answer	Acceptable answers	Marks
6 (a) (iii)	A description to include the following: <ul style="list-style-type: none"> • <u>resistant</u> (1) • (to) <u>insulin</u> (1) 	ignore immune only accept the insulin mark if it is in the context of resistance / unresponsive	(2)

Question Number		Indicative Content	Mark
QWC	*6b	<p>A description to include some of the following points</p> <p>People with type 1 diabetes:</p> <ul style="list-style-type: none"> • insulin injections • into subcutaneous fat layer • easily absorbed into the bloodstream • level of physical activity affects level of insulin required • careful control of carbohydrate diet <p>People with type 2 diabetes:</p> <ul style="list-style-type: none"> • glucose not absorbed into body cells such as the liver / muscles • exercise regularly • careful control of carbohydrate diet • medication (such as Acarbose or Metformin) to reduce glucose in the blood after a meal 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • A limited description of how diabetes is controlled. • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3 - 4	<ul style="list-style-type: none"> • A simple description of how type 1 and type 2 diabetes are controlled or a detailed description of one type of diabetes. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy 	
3	5 - 6	<ul style="list-style-type: none"> • 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. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

Total for question 6 = 12 marks

