



Pearson

Mark Scheme (Results)

January 2018

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	Acceptable answers	Marks
1 (a) (i)	25 (tonnes)		(1)

Question number	Answer	Acceptable answers	Marks
1 (a) (ii)	D <input checked="" type="checkbox"/> respiration		(1)

Question number	Answer	Acceptable answers	Marks
1 (a) (iii)	photosynthesis	accept phonetic spellings of photosynthesis	(1)

Question number	Answer	Acceptable answers	Marks
1 (a) (iv)	A <input checked="" type="checkbox"/> coal		(1)

Question number	Answer	Acceptable answers	Marks
1 (b) (i)	An explanation linking the following points: <ul style="list-style-type: none"> • blackspot fungus cannot grow (1) • where there are high levels of sulfur dioxide pollution (1) 		(2)

Question number	Answer	Acceptable answers	Marks
1 (b) (ii)	An explanation linking two of the following points: <ul style="list-style-type: none"> • sulfur dioxide reacts with / dissolves in water (1) • to form sulfurous acid (1) 	accept clouds for water accept sulphuric acid	(2)

Total for question 1 = 8 marks

Question number	Answer	Acceptable answers	Marks
2 (a) (i)	substitution 72 (\div) 12 (1) evaluation (x)6	accept 2 marks for bald correct answer	(2)

Question number	Answer	Acceptable answers	Marks
2 (a) (ii)	C <input checked="" type="checkbox"/> 130m -135m		(1)

Question number	Answer	Acceptable answers	Marks
2 (b)(i)	C <input checked="" type="checkbox"/> alcohol		(1)

Question number	Answer	Acceptable answers	Marks
2 (b)(ii)	A description linking two of the following points: <ul style="list-style-type: none"> • blocks nerve impulses (1) • neurotransmitters cannot move (1) • across synapses (1) 		(2)

Question number	Answer	Acceptable answers	Marks
2 (c)	A description linking two of the following points: <ul style="list-style-type: none"> • light is the stimulus (1) • electrical impulse (1) • travels along sensory neurone (1) 	accept optic nerve for sensory neurone	(2)

Total for question 2 = 8 marks

Question number	Answer	Acceptable answers	Marks
3 (a) (i)	C <input checked="" type="checkbox"/> positive gravitropism		(1)

Question number	Answer	Acceptable answers	Marks
3 (a) (ii)	Any one of the following: absorb water / absorb minerals / to anchor the plant in the ground		(1)

Question number	Answer	Acceptable answers	Marks
3 (b) (i)	A description linking two of the following: <ul style="list-style-type: none"> • the plant shoot to bends towards the light (1) • cell elongation (1) • (on) the shaded side of the shoot (1) 		(2)

Question number	Answer	Acceptable answers	Marks
3 (b) (ii)	An explanation linking the following points: <ul style="list-style-type: none"> • auxin (1) • is found in the tip of the plant (1) 		(2)

Question number	Answer	Acceptable answers	Marks
3 (c) (i)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • at 15 °C no seeds germinate (1) • at 20 °C 8 seeds germinated / 20 °C is the optimum temperature for seed germination / seeds start germinating at day 2 (1) • at 25 °C 5 seeds germinated / seed germination was not as efficient at 25 °C as at 20 °C / seeds start germinating at day 3 (1) 		(3)

Question number	Answer	Acceptable answers	Marks
3 (c) (ii)	B <input checked="" type="checkbox"/> gibberellin		(1)

Total for question 3 = 10 marks

Question number	Answer	Acceptable answers	Marks
4 (a) (i)	<p>An explanation linking three of the following points:</p> <ul style="list-style-type: none"> • red blood cells deformed / sickle shaped (1) • oxygen carrying capacity of blood is reduced (1) • less (aerobic) respiration (1) • less energy released (1) 	<p>blocked blood vessels (1)</p> <p>painful joints (1)</p>	(3)

Question number	Answer	Acceptable answers	Marks
4 (a) (ii)	<p>genotype (1)</p> <p>recessive (1)</p> <p>homozygous (1)</p>	<p>Answers must be in the correct order.</p> <p>Accept correct phonetic spelling</p>	(3)

Question number	Answer	Acceptable answers	Marks									
4 (b)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>D</td> <td>d</td> </tr> <tr> <td>D</td> <td>DD</td> <td>Dd</td> </tr> <tr> <td>d</td> <td>Dd</td> <td>dd</td> </tr> </table> <p style="text-align: right;">(1)</p> <p>(probability) 25 (%) (1)</p>		D	d	D	DD	Dd	d	Dd	dd	<p>one mark for offspring genotypes</p> <p>one mark for correct probability</p>	(2)
	D	d										
D	DD	Dd										
d	Dd	dd										

Question number	Answer	Acceptable answers	Marks
4 (c)	An explanation linking the following points: <ul style="list-style-type: none"> • build-up of / thick / sticky mucus (1) • which traps (more) bacteria (causing infection) (1) 	accept more mucus	(2)

Total for question 4 = 10 marks

Question number	Answer	Acceptable answers	Marks
5 (a) (i)	$(2\,100\,000 / 16\,820\,000) \times 100$ (1) 12.5 (%)	accept: 12.485 /12.49 (%)	(2)

Question number	Answer	Acceptable answers	Marks
5 (a) (ii)	A description linking two of the following points: <ul style="list-style-type: none"> • (<i>Anopheles</i>) mosquito (1) • pierces the skin (1) • transferring infected blood from person to person (1) 	accept: protozoan in blood is transferred (1)	(2)

Question number	Answer	Acceptable answers	Marks
5 (iii)	A description linking the following points: <ul style="list-style-type: none"> • antiseptic sprayed on (an infected) surface / skin (1) • kills bacteria / pathogen (1) 		(2)

Question Number		Indicative Content	Mark
QWC	*b	<p>A description to include some of the following points</p> <p>Physical barriers</p> <ul style="list-style-type: none"> • skin to prevent entry of microorganisms into the bloodstream • cilia lining the nasal passages • cilia lining the bronchi to prevent entry to lungs • cilia move pathogens out of the lungs • mucus to trap pathogens • scabs prevents entry into the bloodstream • eyelashes stop entry into the eyes • earwax provides some protection against bacteria • nasal hairs prevent entry of pathogens <p>Chemical barriers</p> <ul style="list-style-type: none"> • hydrochloric acid in the stomach to kill microorganisms • lysozymes in tears to kill microorganisms • sebum on skin (antibacterial) 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • A limited description of either a physical or a chemical barrier to infection • 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 both physical and chemical barriers to infection or a detailed description of a physical or chemical barrier. • 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 both physical and chemical barriers to infection • 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	Marks																			
6 (a) (i)	<table border="1"> <thead> <tr> <th rowspan="2">kingdom</th> <th colspan="3">features present</th> </tr> <tr> <th>nucleus</th> <th>chlorophyll</th> <th>cell walls</th> </tr> </thead> <tbody> <tr> <td>Animalia</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Fungi</td> <td>✓</td> <td></td> <td>✓</td> </tr> <tr> <td>Plantae</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table> <p>One mark for each correct line of the table</p>	kingdom	features present			nucleus	chlorophyll	cell walls	Animalia	✓			Fungi	✓		✓	Plantae	✓	✓	✓	(3)
kingdom	features present																				
	nucleus	chlorophyll	cell walls																		
Animalia	✓																				
Fungi	✓		✓																		
Plantae	✓	✓	✓																		

Question number	Answer	Acceptable answers	Marks
6 (a) (ii)	<p>An explanation linking the following statements:</p> <ul style="list-style-type: none"> viruses are considered by scientists to be non-living (1) as they rely on a host organisms to reproduce/grow (1) 		(2)

Question number	Answer	Acceptable answers	Marks
6 (a) (iii)	chordata / chordate	accept: phonetic spellings of chordata / chordates	(1)

Question Number		Indicative Content	Mark
QWC	6b*	<p>A explanation to include some of the following points</p> <p>Scientists place vertebrates into groups based on</p> <ul style="list-style-type: none"> • mammals have fur on their bodies • the platypus has fur • oxygen absorption in mammals is through the lungs • the platypus has lungs • mammals give birth to live young / viviparous • the platypus lays eggs /oviparous • mammals are homeotherms • the platypus cannot always regulate its body temperature so is not fully homeothermic • mammals do not produce venom • the platypus produces venom • mammals do not have bills/beaks • the platypus has a bill/beak • few mammals have webbed feet • the platypus has webbed feet 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • A limited explanation that links at least one characteristic of a mammal to the characteristics of a duck-billed platypus. • 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 that links at least two characteristics of a mammal to the characteristics of a duck-billed platypus. • 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 that links at least three characteristics of a mammal to the characteristics of a duck-billed platypus • 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

