



Mark Scheme (Results)

Summer 2019

Pearson Edexcel International GCSE
In Biology (4BI1) Paper 2BR

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Publications Code 4BI1_2BR_msc_20190822

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Question Number	Answer	Additional guidance	Mark
1(a)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • (burning) <u>fossil</u> fuels / use <u>fossil</u> fuels / use coal / use oil / use gas / eq (1) • deforestation / cutting down trees (1) • increasing population / eq (1) 	Ignore more cars / factories	2

Question Number	Answer	Mark
1(b)	<p>An answer makes reference to one of the following points:</p> <ul style="list-style-type: none"> • wind blows CO₂ away / eq (1) • (computer) maintain / control / alter CO₂ concentration (1) • (wind affects) stomatal opening / transpiration / concentration gradient / absorption of CO₂ / eq (1) 	1

Question Number	Answer	Additional guidance	Mark
1(c)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • (more valid) as similar to natural world / nature / eq (1) • different plants / ecosystem / more species / community / eq (1) • temperature / humidity / rain / light not maintained / controlled (1) 	<p>Allow converse for all Mps</p> <p>Mp 2 Ignore larger scale</p> <p>Mp3 Ignore wind direction / wind speed / monitored / pH / ions</p>	3

Question Number	Answer	Additional guidance	Mark
1(d)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • CO₂ used / required / needed / taken in / absorbed / reactant for / eq (1) • produce carbohydrate / starch / glucose / sugar / eq (1) • low concentration limits (photosynthesis) / is limiting factor / eq (1) 	<p>Mp1 and Mp2 Allow if in equation</p>	2

Question Number	Answer	Additional guidance	Mark
1(e)	<p>A description that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • (weight / bubble) potometer / eq (1) • measure bubble movement / original and final position / change in mass / weigh and reweigh / eq (1) • reference to time / eq (1) • control of named abiotic factor / light / temperature / humidity (1) • repeat / obtain average (1) 	<p>Mp 4 Ignore cover soil or plant with polythene</p>	4

Question Number	Answer	Mark
1(f)	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> • affects CO₂ absorption / eq (1) • affects water loss / transpiration / eq (1) 	2

Question Number	Answer	Mark
1(g)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • use renewable energy / wind / solar / eq (1) • use less <u>fossil</u> fuel / coal / oil / gas / eq (1) • use public transport / cycling / road tax / hybrid / electric cars / less cars / less vehicles / eq (1) • prevent deforestation / plant trees / eq (1) • fewer cattle (1) • less rice farming / paddy fields (1) • less CFC / methane (CH₄) / nitrous oxide (N₂O) / ozone (O₃) / chlorofluorocarbons (CFCs) / hydrofluorocarbons (HCFCs and HFCs) / air conditioning / refrigerator / aerosols / eq (1) 	3

Total 17 marks

Question Number	Answer	Additional guidance	Mark
2(a) (i)	<ul style="list-style-type: none"> number of / amount / all of a species / one species / an organism (in an area / habitat) (1) 	Ignore group	1

Question Number	Answer	Mark
2(a) (ii)	(different/all) species / types / organisms / populations (in a habitat / area / place / environment / ecosystem)	1

Question Number	Answer	Additional guidance	Mark
2(a) (iii)	(all) organisms / community / (different / all) species / biotic factors and environment / area / habitat / abiotic factors / non-living factors / physical factors (1)	Ignore animals and plants	1

Question Number	Answer	Mark
2(b)	<p>The only correct answer is D acidity of soil</p> <p><i>A is not correct as availability of mates is not an abiotic factor</i></p> <p><i>B is not correct as number of pathogens is not an abiotic factor</i></p> <p><i>C is not correct as number of predators is not an abiotic factor</i></p>	1

Question Number	Answer	Mark
2©	<p>The only correct answer is B quadrat</p> <p><i>A is not correct as a potometer is not suitable</i></p> <p><i>C is not correct as a spotting tile is not suitable</i></p> <p><i>D is not correct as a sweep net is not suitable</i></p>	1

Question Number	Answer	Additional guidance	Mark
2(d)	<p>An answer that makes reference to the following:</p> <ul style="list-style-type: none"> • more (biodiversity) in woodland (1) • more species / different organisms / different types / different plants / greater variety of species / more species rich / eq (1) 	<p>Allow converse for wheat field</p>	2

Total 7 marks

Question Number	Answer	Mark
3(a)	The only correct answer is A cortex <i>B is not correct as it is not in the collecting duct</i> <i>C is not correct as it is not in the loop of Henle</i> <i>D is not correct as it is not in the medulla</i>	1

Question Number	Answer	Additional guidance	Mark
3(b)	64 to 66 (1)	Allow mark if seen on graph	1

Question Number	Answer	Mark
3(c)	An explanation that makes reference to four of the following points: <ul style="list-style-type: none"> • protein large (molecule) (1) • cannot enter Bowman's capsule / cannot leave blood / cannot pass through glomerulus / basement membrane / capillaries (1) • glucose (re)absorbed / glucose into blood / glucose into capillaries (1) • proximal convoluted tubule / by active transport / diffusion (1) • urea concentration higher / increased (1) • because water (re)absorbed / water into blood / water into capillaries / urea secreted / urea added to urine (1) 	4

Total 6 marks

Question Number	Answer	Additional guidance	Mark
4(a)(i)	<p>An answer that makes reference to two the following points:</p> <ul style="list-style-type: none"> more poisonous / toxic / dangerous to a cat / cats are more susceptible / cats more easily poisoned / smaller amount needed to poison cat / less required to poison cats / eq (1) by 6 times / 600% / over 1000 / 1065 mg more (1) 	<p>Ignore just quoting figures alone</p> <p>Ignore immunity</p> <p>Allow converse</p>	2

Question Number	Answer	Additional guidance	Mark
4(a)(ii)	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> they would need to eat 350 bars (2) <p>OR</p> <ul style="list-style-type: none"> (for a 70 kg person) each bar provides only 2.86 (mg per kg) (2) 	<p>Allow full marks for correct answer without working</p> <p>calculation $1000 \times 70 = 70\ 000$</p> <p>$70000 \div 200 = 350$</p> <p>OR</p> <p>$200 \div 70 = 2.86$</p> <p>1 mark for 200 (mg) (less than) 70 000</p>	2

Question Number	Answer	Additional guidance	Mark
4(b)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • osmoregulation / homeostasis (1) • collecting duct (1) • less / not permeable (1) • less water (re)absorbed / less water in <u>blood</u> / blood more concentrated / dehydration (1) • more urine / more water in urine / dilute urine / urine not concentrated (1) 		4

Question Number	Answer	Additional guidance	Mark
4(c)	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> • (same) volume / cm^3 / mass / g of water (1) • temperature change / rise / before and after (burning) (1) • (same) mass of chocolate / food (1) • mass of water (g/cm^3) \times temperature rise ($^{\circ}\text{C}$) ($\times 4.2$) \div mass of chocolate (g) 	<p>Allow Mps 1 2 and 3 in formula Mp 1 Ignore amount</p> <p>Reject unexplained symbols</p> <p>Mp 4 mass of chocolate not needed if same mass of chocolate</p>	4

Total 12 marks

Question Number	Answer	Additional guidance	Mark
5(a)	An explanation that makes reference to the following points: <ul style="list-style-type: none"> (less) oxygen (transported) (1) respiration / more <u>anaerobic</u> respiration (1) 	Less aerobic respiration = 2	2

Question Number	Answer	Mark								
5(b)	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Genotype of parents</th> <th>Percentage of offspring likely to have PFK</th> </tr> </thead> <tbody> <tr> <td>both homozygous dominant</td> <td>0</td> </tr> <tr> <td>heterozygous x heterozygous</td> <td>25 (1)</td> </tr> <tr> <td>heterozygous x homozygous recessive</td> <td>50 (1)</td> </tr> </tbody> </table>	Genotype of parents	Percentage of offspring likely to have PFK	both homozygous dominant	0	heterozygous x heterozygous	25 (1)	heterozygous x homozygous recessive	50 (1)	2
Genotype of parents	Percentage of offspring likely to have PFK									
both homozygous dominant	0									
heterozygous x heterozygous	25 (1)									
heterozygous x homozygous recessive	50 (1)									

Question Number	Answer		Mark
5(c)	An explanation that makes reference to the following points: <ul style="list-style-type: none"> (all) offspring are homozygous dominant / none with recessive allele / none with affected allele / none heterozygous / none are carriers (1) all offspring normal / no offspring have PFK (1) 	Ignore less likely	2

Question Number	Answer	Mark
5(d)	An explanation that makes reference to two of the following points: <ul style="list-style-type: none"> offspring all healthy/none have PFK means dog is homozygous (dominant) / no recessive allele (1) offspring 50% healthy/some have PFK means dog is heterozygous / carrier / has recessive allele (1) 	2

Question Number	Answer	Mark
5(e)(i)	<p>The only correct answer is D GUCCAUACC</p> <p><i>A is not correct as the sequence CAGGTATGG is wrong</i></p> <p><i>B is not correct as the sequence CAGGUAUGG is wrong</i></p> <p><i>C is not correct as the sequence GTCCATAACC is wrong</i></p>	1

Question Number	Answer	Mark
5(e)(ii)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • T replaces G / G is replaced by T / GTA to TTA (1) • different mRNA / codon (1) • (different) tRNA / anticodon (1) • different amino acid(s) (1) 	3

Total 12 marks

Question Number	Answer	Mark
6(a)(i)	<ul style="list-style-type: none"> LH / luteinising hormone (1) 	1

Question Number	Answer	Mark
6(a)(ii)	<ul style="list-style-type: none"> release of <u>egg</u> / <u>ovum</u> / <u>ova</u> (1) 	1

Question Number	Answer	Mark
6(b)	<ul style="list-style-type: none"> progesterone (1) 	1

Question Number	Answer	Mark
6(c)	<ul style="list-style-type: none"> ovary / ovaries / corpus luteum / placenta / follicle (1) 	1

Total 4 marks

Question Number	Answer	Additional guidance	Mark
7(a)(i)	<ul style="list-style-type: none"> • $56 \div 146 \times 100$ • $74 \div 167 \times 100$ • $44 - 38 = 6\%$ <p>5.9 to 6.0 (3)</p>	<p>award full marks for correct numerical answer without working</p> <p>Allow one mark for 38 to 38.4 in working</p> <p>Allow one mark for 44 to 44.31 in working</p>	3

Question Number	Answer	Additional guidance	Mark
7(a)(ii)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • increase in (total) supply (1) • increase in farmed (1) • no / little change in wild fish / decrease and increase in wild fish / wild fish fluctuates / wild fish increases <u>slightly</u> / eq (1) 	Ignore quoting values alone	3

Question Number	Answer	additional guidance	Mark
7(b)	<p>An answer that makes reference to six of the following points:</p> <ul style="list-style-type: none"> • selective breeding / GM (1) • separate sizes / ages / sex (1) • use nets / cages / cover / eq (1) • control amounts of food / frequency of feeding / protein rich (1) • remove uneaten food / waste / filter / change water / remove faeces / eq (1) • antibiotics / fungicide / vaccination / remove dead fish / biological control / wrasse / pesticide (1) • oxygen / aerate / use paddles / flowing water (1) • growth hormone / oestrogen(s) (1) 	<p>Mp 5 Ignore clean alone</p> <p>Mp6 Ignore medicine</p>	6

Total 12 marks

