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Mark Scheme (Results)

Summer 2019

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

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Question Number	Answer	Additional guidance	Mark
1(a)	An explanation that makes reference to two of the following points: • (burning) fossil fuels / use fossil 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)	An answer makes reference to one of the following points: • wind blows CO_2 away / eq (1) • (computer) maintain / control / alter CO_2 concentration (1) • (wind affects) stomatal opening / transpiration / concentration gradient / absorption of CO_2 / eq (1)	**1**

Question Number	Answer	Additional guidance	Mark
1(c)	An answer that makes reference to three of the following points: • (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)	Allow converse for all Mps Mp 2 Ignore larger scale Mp3 Ignore wind direction / wind speed / monitored / pH / ions	**3**

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Question Number	Answer	Additional guidance	Mark
1(d)	An explanation that makes reference to two of the following points: • CO_2 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)	Mp1 and Mp2 Allow if in equation	**2**

Question Number	Answer	Additional guidance	Mark
1(e)	A description that makes reference to four of the following points: • (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)	Mp 4 Ignore cover soil or plant with polythene	**4**

Question Number	Answer	Mark
1(f)	An explanation that makes reference to the following points: • affects CO_2 absorption / eq (1) • affects water loss / transpiration / eq (1)	**2**

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Question Number	Answer	Mark
1(g)	An answer that makes reference to three of the following points: • 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 (CH_4) / nitrous oxide (N_2O) / ozone (O_3) / chlorofluorocarbons (CFCs) / hydrofluorocarbons (HCFCs and HFCs) / air conditioning / refrigerator / aerosols / eq (1)	**3**

Total 17 marks

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Question Number	Answer	Additional guidance	Mark
2(a) (i)	• 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)	The only correct answer is D acidity of soil *A is not correct as availability of mates is not an abiotic factor* *B is not correct as number of pathogens is not an abiotic factor* *C is not correct as number of predators is not an abiotic factor*	**1**

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

Question Number	Answer	Additional guidance	Mark
2(d)	An answer that makes reference to the following: • more (biodiversity) in woodland (1) • more species / different organisms / different types / different plants / greater variety of species / more species rich / eq (1)	Allow converse for wheat field	**2**

Total 7 marks

Question Number	Answer	Mark
3(a)	The only correct answer is A cortex *B is not correct as it is not in the collecting duct* *C is not correct as it is not in the loop of Henle* *D is not correct as it is not in the medulla*	**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©	An explanation that makes reference to four of the following points: • 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

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Question Number	Answer	Additional guidance	Mark
4(a)(i)	An answer that makes reference to two the following points: • 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)	Ignore just quoting figures alone Ignore immunity Allow converse	**2**

Question Number	Answer	Additional guidance	Mark
4(a)(ii)	An explanation that makes reference to the following points: • they would need to eat 350 bars (2) OR • (for a 70 kg person) each bar provides only 2.86 (mg per kg) (2)	Allow full marks for correct answer without working calculation 1000 x 70 = 70 000 70000÷ 200 = 350 OR 200 ÷ 70 = 2.86 1 mark for **200** (mg) (less than) **70 000**	**2**

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Question Number	Answer	Additional guidance	Mark
4(b)	An explanation that makes reference to four of the following points: • 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)	An explanation that makes reference to the following points: • (same) volume / cm^3 / mass / g of water (1) • temperature change / rise / before and after (burning) (1) • (same) mass of chocolate / food (1) • mass **<u>of water</u>** (g/cm^3) × temperature rise (°C) (× 4.2) ÷ mass of chocolate (g)	Allow Mps 1 2 and 3 in formula Mp 1 Ignore amount Reject unexplained symbols Mp 4 mass of chocolate not needed if same mass of chocolate	**4**

Total 12 marks

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Question Number	Answer	Additional guidance	Mark
5(a)	An explanation that makes reference to the following points: • (less) oxygen (transported) (1) • respiration / more <u>anaerobic</u> respiration (1)	Less aerobic respiration = 2	**2**

Question Number	Answer	Mark
5(b)		**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: • (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: • 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**

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Question Number	Answer	Mark
5(e)(i)	The only correct answer is D GUCCAUACC *A is not correct as the sequence CAGGTATGG is wrong* *B is not correct as the sequence CAGGUAUGG is wrong* *C is not correct as the sequence GTCCATACC is wrong*	**1**

Question Number	Answer	Mark
5(e)(ii)	An explanation that makes reference to three of the following points: • 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

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Question Number	Answer	Mark
6(a)(i)	• LH / luteinising hormone (1)	**1**

Question Number	Answer	Mark
6(a)(ii)	• release of egg / ovum / ova (1)	**1**

Question Number	Answer	Mark
6(b)	• progesterone (1)	**1**

Question Number	Answer	Mark
6(c)	• ovary / ovaries / corpus luteum / placenta / follicle (1)	**1**

Total 4 marks

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Question Number	Answer	Additional guidance	Mark
7(a)(i)	• 56 ÷ 146 × 100 • 74 ÷ 167 × 100 • 44 – 38 = 6% 5.9 to 6.0 (3)	award full marks for correct numerical answer without working Allow one mark for 38 to 38.4 in working Allow one mark for 44 to 44.31 in working	**3**

Question Number	Answer	Additional guidance	Mark
7(a)(ii)	An answer that makes reference to three of the following points: • 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**

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Question Number	Answer	additional guidance	Mark
7(b)	An answer that makes reference to six of the following points: • 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)	Mp 5 Ignore clean alone Mp6 Ignore medicine	**6**

Total 12 marks

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