



Mark Scheme (Results)

Summer 2024

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

Question Number	Answer	Mark
1(a)	<ul style="list-style-type: none"> drowning / being washed overboard / sinking / storms / (bad) weather / attacked / killed by sharks by predators / eq (1) 	1

Question Number	Answer	Mark
1(b)	<p>An explanation that makes reference to three of the following points:</p> <ol style="list-style-type: none"> only based on forecasts / model / not happened yet / can't predict future / 30 years is a long way off / not guaranteed / eq (1) other (scientists) have different view / only an opinion / government policy may change / eq (1) amount of sea farms may change / may not work / unproven / untested / eq (1) peoples' tastes may changes / diet / choices / demand for fish may change / eq (1) effect of climate change / sea temperature rising / levels rising / global warming / eq (1) effect of pollution / eq (1) 	3

Question Number	Answer	Additional guidance	Mark
1(c)	<p>An explanation that makes reference to three of the following points:</p> <ol style="list-style-type: none"> (fish) faeces / waste / uneaten food / eq (1) nitrate / phosphate levels increase / eq (1) leads to algal growth / eutrophication / (eq) less oxygen (for respiration)/ oxygen used (by bacteria) / eq (1) chemicals / hormones / eq (1) bacteria / decomposers / eq (1) 	allow pesticide / insecticide/ fungicide / antibiotic	3

Question Number	Answer	Additional guidance	Mark
1(d)(i)	<p>A description that makes reference to two of the following points:</p> <ol style="list-style-type: none"> 1. pesticide / insecticide / fungicide / eq (1) 2. antibiotics / vaccinate fish / eq (1) 3. selective breeding / GM fish / eq (1) 4. separating / isolating diseased fish / removing sick / dead fish / eq (1) 5. low stocking density /eq (1) 	<p>ignore medicine / drugs</p> <p>not species</p>	2

Question Number	Answer	Additional guidance	Mark
1(d)(ii)	<p>An explanation that makes reference to two of the following points:</p> <ol style="list-style-type: none"> 1. pesticide / insecticide / fungicide/ antibiotic / kill other organisms / disrupt food chain /eq (1) 2. (pesticide / insecticide / fungicide / antibiotics) can (bio)accumulate / eq (1) 3. (antibiotics) lead to antibiotic resistance / eq (1) 4. selective bred / GM organisms may escape and interbreed / eq (1) 	<p>need method and effect</p>	2

Question Number	Answer	Mark
1(e)	<p>An explanation that makes reference to two of the following points:</p> <ol style="list-style-type: none"> 1. deep water / greater volume / eq (1) 2. (so) dilution / reduces concentration / eq (1) 3. fast water flowing / eq (1) 4. (so) dispersed / carried away / eq (1) 	2

Question Number	Answer	Additional guidance	Mark
1(f)	<p>An answer that includes :</p> <ul style="list-style-type: none"> • further from shore / further from land / isolated / longer distance to travel / no population nearby / need to use boat to reach / take a long time to get there / eq (1) 	<p>ignore ref to weather</p>	1

Question Number	Answer	Additional guidance	Mark
1(g)	<p>An answer that includes one of :</p> <ul style="list-style-type: none"> • is cheaper / use cheaper food (readily available) / surplus food / crop waste /eq (1) • more efficient energy transfer / eq (1) • will not eat each other / other fish / eq(1) 	Allow converse	1

Question Number	Answer	Additional guidance	Mark
1(h)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • less fuel / less transport of equipment /supplies / workers / less food miles / eq (1) • less energy used / less electricity / less machinery (in running / building) / eq (1) • less carbon dioxide released (from burning the fossil fuel) / eq (1) 	allow converse	2

Total = 17 marks

Question Number	Answer	Mark
2(a)	<p>The only correct answer is D homeostasis</p> <p><i>A is not correct as it is not absorption</i></p> <p><i>B is not correct as it is not diffusion</i></p> <p><i>C is not correct as it is not egestion</i></p>	1

Question Number	Answer	additional guidance	Mark
2(b)(i)	<p>Calculation method not marking points</p> <p>insensible loss = $0.4 + 0.5 = 0.9$</p> <p>percentage = $0.9 \div \text{total loss}$</p> <p>$(0.9 \div 2.5) \times 100$</p> <p>= 36% (2)</p>	<p>allow 1 for 0.9</p> <p>or $\div 2.5$</p> <p>allow full marks for 36 with no working</p>	2

Question Number	Answer	additional guidance	Mark
2(b)(ii)	<p>Calculation method not marking points</p> <p>per kg fluid input = 0.5 for 70 kg</p> <p>= $0.5 \div 70 = 0.0071$ litre per kg</p> <p>= $0.0071 \times 110 = 0.78$</p> <p>allow any value between 0.77- 0.80(2)</p>	<p>allow 1 mark for $\div 70$ or $\times 110$</p> <p>for 2 marks with no working</p>	2

Question Number	Answer	additional guidance	Mark
2(b)(iii)	<p>An explanation that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. more water lost / less water in body / eq (1) 2. water / liquid lost in vomiting / faeces / diarrhoea / eq (1) 3. (more) sweating / eq (1) 4. concentration of blood increases / water potential lowered / eq (1) 5. (more) ADH produced / secreted / eq (1) 6. by hypothalamus / pituitary (1) 7. permeability of collecting duct increases / eq (1) 8. more water <u>re</u>absorbed / less water lost in urine / more concentrated urine / less urine / eq (1) 	less water absorbed from food	4

Question Number	Answer	additional guidance	Mark
2(c)	<p>An answer that makes reference to four of the following points:</p> <p style="text-align: center;">In winter</p> <ol style="list-style-type: none"> 1. body mass lower / eq (1) 2. as fewer plants available / less food / hibernating / eq (1) 3. less sunlight / lower temp / less photosynthesis / eq (1) 4. (much) more water intake / eq (1) 5. as more rainfall/ eq (1) 6. less concentrated urine in winter / more urine / eq (1) 7. (so) more water lost in urine / eq (1) 8. Ref to data for urine 3× less concentrated in winter / water input 4 × higher in winter / eq (1) 	<p>In summer</p> <p>higher in summer</p> <p>more plants</p> <p>more sunlight</p> <p>less water intake</p> <p>less rainfall</p> <p>more concentrated</p> <p>less water lost</p> <p>urine x 3 more conc/ water input 4 x lower</p> <p>urine x 3 more conc. in summer scores 2 marks mp 8 and 6</p>	4

Total = 13 marks

Question Number	Answer	Mark
3(a)(i)	<p>The only correct answer is D T (is the pore of a sweat gland)</p> <p><i>A is not correct as Q is not the pore of a sweat gland</i></p> <p><i>B is not correct R is not the pore of a sweat gland</i></p> <p><i>C is not correct S is not the pore of a sweat gland</i></p>	1

Question Number	Answer	Mark
3(a)(ii)	<p>The only correct answer is B R (is the structure that carries blood)</p> <p><i>A is not correct as P is not the structure that carries blood</i></p> <p><i>C is not correct as S is not the structure that carries blood</i></p> <p><i>D is not correct as T is not the structure that carries blood</i></p>	1

Question Number	Answer	additional guidance	Mark
3(a)(iii)	<p>A description that that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. <u>vasoconstriction</u> (1) 2. arterioles supplying capillaries near skin surface constrict / blood vessels supplying skin narrow /eq (1) 3. less blood (flows) to skin surface / eq (1) 4. (hair) erector muscle contract / hair stands up eq (1) 5. traps air / insulates/ eq (1) 6. less heat loss by radiation / convection / evaporation (of sweat) eq (1) 7. less sweating / eq (1) 	<p>ignore shivering</p> <p>reject capillaries</p> <p><u>arterioles</u> <u>constrict</u> = mp 1 and mp 2</p> <p>more away from skin surface</p> <p>not just less heat loss unqualified</p> <p>less evaporation of sweat scores mp 7 only</p>	4

Question Number	Answer	additional guidance	Mark
3(b)	<p>An answer that that makes reference to five of the following points:</p> <ol style="list-style-type: none"> 1. (mean) skin temperature is high(er) in young /eq (1) 2. (mean) skin temperature is high(er) with heat strain / eq (1) 3. mean sweating rate high(er) in young / eq (1) 4. mean sweating rate high(er) in moderate / higher heat strain/ eq (1) 5. small(er) difference in sweating rate between low and moderate strain in young / eq (1) 6. no information on sweat rate with no heat strain / at rest / eq (1) 7. more sweat glands in young / each gland produces more sweat in young / eq (1) 8. young can reduce (core) body temperature faster / more / young less likely to overheat /eq (1) 9. numbers very small / not repeated / unreliable / no information on age / eq (1) 10.no information on BMI / fat layers / health / diet / eq (1) 	allow converse	5

Total = 11 marks

Question Number	Answer	additional guidance	Mark
4(a)(i)	<ul style="list-style-type: none"> colour of indicator / carbon dioxide concentration / eq (1) 	not gas exchange	1

Question Number	Answer	Mark
4(a)(ii)	<ul style="list-style-type: none"> stops leaves / maggots falling in indicator / hold organisms in place / separates organism from solution/ eq (1) 	1

Question Number	Answer	additional guidance	Mark
4(a)(iii)	<ul style="list-style-type: none"> volume of indicator / volume of solution / time in tube / size of tube / eq (1) 	allow mass / 5cm ³ / conc of indicator not amount of indicator	1

Question Number	Answer	Mark
4(b)	<p>An explanation that that makes reference to four of the following points:</p> <ol style="list-style-type: none"> tube C / tube D / maggots produce CO₂ / CO₂ increases (light and dark) / eq (1) by respiration / eq (1) tube B / leaves produce CO₂ in dark / CO₂ increases / eq (1) tube A / leaves absorb CO₂ in the light / CO₂ decreases/ eq (1) for photosynthesis /eq (1) tube E no change in CO₂ / no gain or loss of CO₂ / eq (1) 	4

Question Number	Answer	Mark
4(c)	<p>An explanation that that makes reference to two of the following points:</p> <ul style="list-style-type: none"> carbon dioxide concentration is unchanged / CO₂ released and CO₂ absorbed / eq (1) respiration and photosynthesis / eq (1) 	2

Total = 9 marks

Question Number	Answer	additional guidance	Mark
5(a)(i)	<p>Calculation method not marking points</p> <p>global loss from Russia Brazil and Canada = $76.0 + 62.8 + 49.3 = 188.1$ Mha</p> <p>in percentage = 42%</p> <p>therefore total global loss = $188.1 \div 42$</p> <p>1% = 4.48</p> <p>total global loss = $448 \text{ Mha} - 188.1 = 259.9$ Mha</p> <p>allow answer in range 258 to 260 (2)</p>	<p>allow 1 for (1% =) 4.47 to 4.49 Or for (100%) = 447-449</p>	2

Question Number	Answer	additional guidance	Mark
5(a)(ii)	<p>Calculation method not marking points</p> <p>loss from 2001 to 2021 = 62.8 Mha</p> <p>$62.8 \div (20 \times 12)$</p> <p>0.262</p> <p>= 2.62×10^{-1} (2)</p>	<p>allow 1 for $\div 240$ or $\div (20 \times 12)$</p> <p>or 1 for 0.26 / 0.262 / 0.2617 / 0.2616 recurring</p> <p>allow 2.6×10^{-1} or 2.617×10^{-1} (2)</p>	2

Question Number	Answer	additional guidance	Mark
5(a)(iii)	<p>An explanation that's makes reference to two of the following :</p> <ul style="list-style-type: none"> • Russia has the most forest / larger area / bigger country / most tree cover / has high biomass / many trees / eq (1) • has a big effect on total / makes up a large % of the world / contributes more to total / world / high proportion of the total trees / eq (1) • so even a low percentage change is a large amount / eq (1) 		2

Question Number	Answer	Mark
5(b)	A description that makes reference to four of the following points: 1. reduces biodiversity / loss of species / habitat loss / eq (1) 2. increases CO ₂ / less CO ₂ absorbed / eq (1) 3. less photosynthesis / eq (1) 4. reduced soil quality / less minerals returned to soil / less fertile / barren / leaching / eq (1) 5. soil erosion / washed away / eq (1) 6. flooding / eq (1) 7. disturbs water cycle / less transpiration / less rainfall / eq (1)	4

Total = 10 marks

Question Number	Answer	additional guidance	Mark
6(a)	An answer that makes reference the following <ul style="list-style-type: none"> gene is a section of DNA that codes for a single polypeptide / protein and a genome includes all of the DNA / all of the genes in an organism /eq (1) 	require both for 1 mark	1

Question Number	Answer	additional guidance	Mark
6(b)	An explanation that makes reference to four of the following points: <ol style="list-style-type: none"> DNA unzips / unwinds / eq (1) <u>mRNA</u> / <u>messenger RNA</u> / eq (1) mRNA copies code of DNA strand / DNA code copied / sequence copied / code carried by mRNA / eq (1) in nucleus / leaves nucleus / eq (1) mRNA goes to ribosome / eq (1) 	DNA acts as template for mRNA	4

Question Number	Answer	Mark
6(c)	An explanation that makes reference to three of the following points: <ol style="list-style-type: none"> some sequences / codons / different codes / different bases / may code for same amino acid /eq (1) no change in protein / same protein / no change in enzyme / same enzyme / eq (1) may not affect bonding / (3D) shape / active site of enzyme / still binds to substrate / eq (1) allele may be recessive / not expressed / eq (1) non-coding DNA / eq (1) 	3

Question Number	Answer	additional guidance	Mark
6(d)	<p>An answer that makes reference to the following points:</p> <p>genes only</p> <ul style="list-style-type: none"> • blood group / eye colour / examples of single genes / eq (1) <p>genes and environment</p> <ul style="list-style-type: none"> • mass / height / skin colour / behavioural traits / eq (1) 	<p>Examples seen</p> <p>iris colour</p> <p>figure / body shape / hair colour</p>	2

Total = 10 marks