Mark Scheme (Results)

January 2026

Pearson Edexcel International Advanced Level In Biology
WBI14/01A

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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.

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Question number	Answer	Mark
1(a)(i)	The only correct answer is **C** **A** *is incorrect because NPP = 20 810 – 11 977 = 8 833* ***B*** *is incorrect because NPP = 20 810 – 11 977 = 8 833* ***D*** *is incorrect because NPP = 20 810 – 11 977 = 8 833*	**(1)**

Question number	Answer	Mark
1(a)(ii)	The only correct answer is **A** **B** *is incorrect because these terms only apply to plants which are only on trophic level 1* ***C*** *is incorrect because these terms only apply to plants which are only on trophic level 1* ***D*** *is incorrect because these terms only apply to plants which are only on trophic level 1*	**(1)**

Question number	Answer	Additional guidance	Mark
1(b)	A description that includes three of the following points: • by decomposition / digestion (of organic matter) (1) • by enzymes (released from bacteria / fungi / decomposers) (1) • proteins converted into amino acids / nucleic acids broken down into nucleotides (1) • (carbon released as) carbon dioxide from respiration (1)	Decomposing bacteria ACCEPT break down/decay ACCEPT named enzyme e.g protein into ammonia/glycogen into glucose/cellulose into glucose	**(3)**

Question number	Answer	Additional guidance	Mark
2(a)	An explanation that includes four of the following points: • increase in temperature increases kinetic energy (of enzymes/substrates) (1) • resulting in more collisions between enzymes and substrates (1) • ATP synthetase works faster (1) • therefore more ATP for the light-independent reaction (1) • RUBISCO works faster (1) • therefore more glucose produced by the {light-independent reaction / Calvin cycle} (1)	ACCEPT converse for decrease ACCEPT more ESCs ACCEPT ATP synthase ACCEPT more {carbon fixation/ GP/ GALP}	**(4)**

Question number	Answer	Mark
2(b)	The only correct answer is **D** **A** *is incorrect because 34 ÷ 22 = 1.5454545 = 1.55* ***B*** *is incorrect because 34 ÷ 22 = 1.5454545 = 1.55* ***C*** *is incorrect because 34 ÷ 22 = 1.5454545 = 1.55*	**(1)**

Question number	Answer	Additional guidance	Mark
3(a)(i)	• Answer in the required range	2054-2084	**(1)**

Question number	Answer	Additional guidance	Mark
3(a)(ii)	An answer that includes two of the following points: • because they think that climate change is happening faster than they thought (1) • which will cause more ice to melt/ice will melt faster (1) • scientists may use data other than that shown on this graph (1)	ACCEPT temperatures rising faster than expected/greenhouse gas emissions greater than expected IGNORE temperatures rising/more greenhouse gases	**(2)**

Question number	Answer	Additional guidance	Mark
3(a)(iii)	An explanation that includes the following points: • because the overall trend is that the extent of Arctic sea ice is decreasing (1) • but between (2007 and 2020) there is no overall change (1)	ACCEPT 2007-2020 is lower than previous years ACCEPT similar values in (2007 and 2020)/it fluctuates between (2007 and 2020)	**(2)**

Question number	Answer	Additional guidance	Mark
3(b)	An answer that includes the following points: • because the berries and grass provide less energy (than the fat of seals) (1) • because the energy used to swim longer distance is greater than the energy gained from the food caught (1)	ACCEPT calories throughout ACCEPT they are swimming further so using more energy	**(2)**

Question number	Answer	Additional guidance	Mark
3(c)	An explanation that includes two of the following points: • ice made from seawater has a higher concentration of salt (1) • therefore {less heat/energy/lower temperature} required to melt the ice (1) • so this ice will melt faster at the same temperature (1)		**(2)**

Question number	Answer	Additional guidance	Mark
4(a)(i)	An explanation that includes the following points: • only the egg cell {mtDNA/mitochondria} will be present (in the zygote) (1) • and all the cells (in the tissues come from the zygote) from mitosis (1)	ACCEPT mitochondria found in sperm not involved in fertilisation	**(2)**

Question number	Answer	Additional guidance	Mark
4(a)(ii)	An explanation that includes the following points: • because there are many replication cycles (in the PCR process) (1) • and the quantity of DNA doubles every time (1)	ACCEPT any number over 20 times Ignore a few times ACCEPT each DNA molecule gives 2 new molecules	**(2)**

Question number	Answer	Additional guidance	Mark
4(b)	An explanation that includes four of the following points: • because the types of insects present change with time after death (1) • insects go through different stages in their life cycle (1) • (insects) can be used to determine the time of death (1) • because different types of insect are found in different areas (1) • (insects) can be used to determine {the place of death / if the body has been moved} (1)	ACCEPT examples e.g. blowfly to beetles/Insects follow a set stage of succession ACCEPT these can be compared with standardised data	**(4)**

Question number	Answer	Additional guidance	Mark
4(c)(i)	An answer that includes three of the following points: • numbers increased and then fell again in all regions (except central) (1) • overall there has been no change in total elephants (1) • numbers in Eastern decrease from 2002 to 2013/ numbers in South increase from 2002 to 2013(1) • There isn't much change in the areas that had a small number of elephants to start with (Central and West) (1)	ACCEPT Eastern and South increases (2002 to 2007) then decreases ALLOW piece together	**(3)**

Question number	Answer	Additional guidance	Mark
4(c)(ii)	An answer that includes three of the following points: • police can be concentrated in the areas in Africa where a large number of elephants are being poached (1) • tusks can be removed from elephants in countries where elephants are poached (1) • because most ivory was taken in Kenya/Tanzania(1) • borders of countries receiving (large amounts of) ivory can be patrolled (1) • for example country A which had the highest mass of ivory seized (1)	ACCEPT increased security/surveillance e.g trace trafficking routes	**(3)**

Question number	Answer	Mark
5(a)	The only correct answer is **A** **B** *is incorrect because nitrogen is not a greenhouse gas* ***C*** *is incorrect because neither nitrogen nor oxygen are greenhouse gases* ***D*** *is incorrect because oxygen is not a greenhouse gas*	**(1)**

Question number	Answer	Additional guidance	Mark
5(b)	• values selected using a suitable method (1) • answer given as a whole number (1)	Example of calculation 3500-2300 = 2900 , 2900- 750 ÷ 38 = 57 Values read from graph 3500 and 2300 and 750 56.57895 57 Bald answer of 72 or 76 = 1 mark	**(2)**

Question number	Answer	Additional guidance	Mark
5(c)	An explanation that includes the following points: • (sustainable as the plants used to make biofuels) can be regrown (1) • therefore they are removing carbon dioxide from the (atmosphere/air) (1) • for use in the {Calvin cycle/ light independent reaction/carbon fixation} (1)	IGNORE carbon neutral ACCEPT plants act as a carbon sink	**(3)**

Question number	Answer
***5(d)**	Indicative content Arguments for: • faeces are a waste product/ produced every day– so something good coming out of waste - reduces the need / cost to get rid of this waste product/less space for disposal • using faeces would reduce the use of growing plants to make biofuels – therefore land can still be used for growing crops • using faeces would lower the consumption of fossil fuels – therefore they will last longer/there is an alternative for the future/ could lead to less release of CO_2 overall • using faeces means less loss of land/deforestation – more plants left so more CO_2 removed from the atmosphere Arguments against: • faeces could contain pathogenic bacteria – increasing the risk of spreading disease • faeces would need collecting/transporting – burning fossil fuels /releases carbon dioxide into the atmosphere • a lot of faeces needed to make the kerosene – is this going to be cost effective? - transport / production will use fossil fuels that will release carbon dioxide • factories to process needed – destroying habitats • process hasn't been refined/technology not developed – this could be very expensive – money better spent elsewhere - may not even work – money wasted. -take too long • does not solve the problem of aircraft producing greenhouse gases – reducing flying would be more effective - will enough kerosene ever be produced • might be difficult to find people willing to work on project – due to risk of contamination/smell/concerns about disease • faeces need to be stored/transported/when burnt – may smell unpleasant/ produce toxic gases/increase risk of spreading disease/pathogens **(6)**

			Additional guidance
Level 0	0	No awardable content	
Level 1	1-2	An explanation may be attempted but with limited interpretation or analysis of the scientific information and with a focus on mainly just one piece of scientific information. The explanation will contain basic information, with some attempt made to link knowledge and understanding to the given context.	Simple description 1 mark = one point made 2 marks = two points made
Level 2	3-4	An explanation will be given, with occasional evidence of analysis, interpretation and/or evaluation of both pieces of scientific information. The explanation shows some linkages and lines of scientific reasoning, with some structure.	Some explanation given using the information given / own knowledge 3 marks = explanation of one point made 4 marks = explanation of two points made
Level 3	5-6	An explanation is made that is supported throughout by sustained application of relevant evidence of analysis, interpretation and/or evaluation of both pieces of scientific information. The explanation shows a well-developed and sustained line of scientific reasoning, which is clear and logically structured.	Detailed explanation given using the information given / own knowledge 5 marks = explanation of three points made that includes at least one advantage and one disadvantage 6 marks = explanation of four points made that includes at least one advantage and one disadvantage

Question number	Answer	Mark
6(a)(i)	The only correct answer is **D** **A** *is incorrect because hydrogen bonds between base pairs join two strands together* ***B*** *is incorrect because hydrogen bonds don't form between two nucleotides* ***C*** *is incorrect because phosphodiester bonds do not form between base pairs*	**(1)**

Question number	Answer	Mark
6(a)(ii)	The only correct answer is **B** **A** *is incorrect because Ebola has a helical capsid* ***C*** *is incorrect because lambda phage has a complex capsid* ***D*** *is incorrect because TMV has a helical capsid*	**(1)**

Question number	Answer	Mark
6(a)(iii)	The only correct answer is **C** **A** *is incorrect because both Ebola and HIV have envelopes* ***B*** *is incorrect because HIV has an envelope* ***D*** *is incorrect because Ebola has an envelope*	**(1)**

Question number	Answer	Additional guidance	Mark
6(b)(i)	An explanation that includes three of the following points: • because PCV {does not contain / cannot make its own} DNA polymerase (1) • (for viral DNA to be synthesized) a complementary {copy/ strand/sequence} has to be made (1) • Viral DNA is replicated when host cell DNA is replicated (1) • DNA polymerase involved in lining up the nucleotides (1)	ACCEPT the virus for PCV ACCEPT formation of phosphodiester bonds (between nucleotides)	**(3)**

Question number	Answer	Additional guidance	Mark
6(b)(ii)	An explanation that includes three of the following points: • (pre) mRNA copy (of gene) made (1) • post-transcriptional {changes / modification} (of pre-mRNA) occurs (1) • introns (and some exons) {removed/spliced} (1) • forming different mRNA sequences which are translated (into different proteins) (1)	ACCEPT (gene) is transcribed into (pre) mRNA ACCEPT alternative splicing ACCEPT exons are rearranged	**(3)**

Question number	Answer
***6(c)**	Indicative content Graph: Group A • some antibodies present at start of pregnancy (D) • because they had previously been exposed to PCV/ vaccinated (before) (E) • following vaccine on day 0 the levels of antibodies increased (D) • because (secondary) immune response stimulated (E) • levels of antibody continued to increase to 30 days (D) • because of second vaccine at day 20 (E) • levels fell slightly until 140 days (D) • as antibodies removed/ broken down (E) • as antibodies crossed the placenta into the piglets (E) • levels increased at day 140 (D) • because of vaccine given at day 140 (E) • because (secondary) immune response stimulated (E) • levels dropped at day 160 (D) • because mothers were suckling their young (E) Group B • some antibodies present at start of pregnancy (D) • because pigs had previously been exposed to PCV/ vaccinated (before) (E) • levels dropped slightly (D) • as antibodies removed from body (in urine) (E) • as antibodies crossed the placenta into the piglets (E) Table: Group A • antibodies present as soon as born (D) • because antibodies passed from mother / natural passive immunity (E) • antibody levels fell slightly (D) • as antibodies removed from body/broken down (E) • No natural active immunity as virus destroyed before an immune response can be initiated (E) Group B • very low levels of antibody when born (D) • as low levels of antibody in mothers to pass to piglets (E) • levels of antibody increases (D) • because piglets become infected with PCV (E) • resulting in (primary) immune response / natural active immunity (E) **(6)**

			Additional guidance
Level 0	0	No awardable content	
Level 1	1-2	An explanation may be attempted but with limited interpretation or analysis of the scientific information and with a focus on mainly just one piece of scientific information. The explanation will contain basic information, with some attempt made to link knowledge and understanding to the given context.	Simple description 1 mark = one point made from either graph or table 2 marks = one point made from graph and another from the table
Level 2	3-4	An explanation will be given, with occasional evidence of analysis, interpretation and/or evaluation of both pieces of scientific information. The explanation shows some linkages and lines of scientific reasoning, with some structure.	Some explanation 3 marks = simple explanation of either graph or table 4 marks = simple explanation of both graph and table
Level 3	5-6	An explanation is made that is supported throughout by sustained application of relevant evidence of analysis, interpretation and/or evaluation of both pieces of scientific information. The explanation shows a well-developed and sustained line of scientific reasoning, which is clear and logically structured.	Detailed explanation – including explanation of groups A and B 5 marks = simple explanation of either graph or table and detailed explanation of the other 6 marks = detailed explanation of both graph and table

Question number	Answer	Additional guidance	Mark
7(a)(i)	An answer that includes **two** of the following points: • redness/red/rubor • swelling/enlarged • pain/hurts/tender/aches/throbbing/dolor • heat/warmth • loss of function	IGNORE rash ACCEPT oedema IGNORE itching/immobility IGNORE fever	**(1)**

Question number	Answer	Additional guidance	Mark
7(a)(ii)	An explanation that includes two of the following points: • (normal) gut flora {compete with / destroy} pathogenic bacteria (1) • {change/reduction} in gut flora may reduce competition (1) • changed gut flora may include pathogens (1)	ACCEPT Less gut flora means enough nutrients for pathogens to survive ACCEPT pathogen could be introduced causing an immune response	**(2)**

Question number	Answer	Additional guidance	Mark
7(b)(i)	An explanation that includes one of the following pairs of points: • there may be pathogenic bacteria (in the faeces from the healthy dolphin) (1) • which could cause {disease/illness/infection/sickness} (to the dolphins) (1) **OR** • the injection site might become infected (1) • (causing the dolphin) to {die / become ill} (1) **OR** • handling the dolphins might cause them stress / injure the dolphin (1) • (causing the dolphin) to die (1)		**(2)**

Question number	Answer	Additional guidance	Mark
7(b)(ii)	A description that includes the following points: • all types of bacteria are found in both dolphins except type D and type F (1) • type C is the most abundant type in both dolphins (1) • credit comparison of one type of bacteria between the two dolphins (1)	ACCEPT D and F found only in diseased dolphin /both have A,B,C,E e.g. diseased dolphin has more Type B/Type E	**(3)**

Question number	Answer	Additional guidance	Mark
7(b)(iii)	A description that includes three of the following points: • make a {suspension/broth} of gut bacteria (1) • spread the bacteria on agar (1) • incubate at the body temperature (of a dolphin) (1) • credit a means of identifying the types of bacteria (1) • credit means of determining abundance of each type of bacteria (1)	DO NOT ACCEPT streaking Culture for suitable temperature e.g 30-40 e.g. colony colour, antibodies, antibiotics, selective media, stains e.g. colony counting, optical methods, turbidity, dilution plating, haemocytometer	**(3)**

Question number	Answer	Additional guidance	Mark
7(b)(iv)	An answer that includes two of the following points: • some of the bacteria may not grow in the culture conditions used (1) • credit a reason why the method of identification may not be as accurate (1) • credit a reason why the method used to obtain abundance may not be as accurate (1)	e.g culturing techniques may have more of a risk of contamination/DNA analysis can distinguish between closely related bacteria e.g Proportion of bacteria may change during the culturing process/bacteria replicate at different rates/there may be multiple bacteria counted as one colony	**(2)**

Question number	Answer	Additional guidance	Mark
7(b)(v)	An explanation that includes two of the following points: • (reducing the use of antibiotics) decreases the {development / spread} of (antibiotic) resistance (1) • as it acts as a selection pressure (1) • therefore prolonging the time that antibiotics can be used (1)	**ACCEPT** a description of selection pressure ACCEPT so that antibiotics can still be used/fewer new antibiotics need to be developed	**(2)**

Question number	Answer	Additional guidance	Mark
8(a)	• (change) {resulting from / caused by} {man / humans / people} (1)		**(1)**

Question number	Answer	Additional guidance	Mark
8(b)(i)	• 6 / 5.8 (1)	ACCEPT 5.83 DO NOT ACCEPT 6.0	**(1)**

Question number	Answer	Additional guidance	Mark
8(b)(ii)	An answer that includes the following points: • bars have been selected to make the increase look exponential (1) • e.g. 2008 to 2020 is 70 and 2050 to 2100 is 260 (1)	ACCEPT X axis/time/year does not have a linear scale X axis is not equal between intervals. eg first increment is 12 and the second increment is 10	**(2)**

Question number	Answer	Mark
8(c)(i)	The only correct answer is **A** **B** *is incorrect because 43 : 64 = (43 ÷ 64) : 1 = 0.671875 : 1* ***C*** *is incorrect because 43 : 64 = (43 ÷ 64) : 1 = 0.671875 : 1* ***D*** *is incorrect because 43 : 64 = (43 ÷ 64) : 1 = 0.671875 : 1*	**(1)**

Question number	Answer	Mark
8(c)(ii)	The only correct answer is **D** **A** *is incorrect because (733 ÷ 756) × 100 = 96.957671* ***B*** *is incorrect because (733 ÷ 756) × 100 = 96.957671* ***C*** *is incorrect because (733 ÷ 756) × 100 = 96.957671*	**(1)**

Question number	Answer	Additional guidance	Mark
8(c)(iii)	An explanation that includes the following points: • median value is the middle value while the mean is number of pieces of plastic divided by number of birds (1) • mean is (more) affected by extreme values/median is less affected by extreme values (1)	ACCEPT a few birds with high numbers of microplastics will change the mean/not the median (1)	**(2)**

Question number	Answer	Additional guidance	Mark
8(c)(iv)	A description that includes two of the following points: • all types of MP are found in both regions (1) • more of each type of plastic is found in the Antarctic except PE (1) • PP is the most common in the Antarctic and PE in the Arctic (1)	ACCEPT PET is lowest in Arctic and Antarctic	**(2)**

Question number	Answer	Additional guidance	Mark
8(d)(i)	An explanation that includes two of the following points: • up to pH 6 more MP removed/less removed after PH 6(1) • because up to pH 6 more bonds are breaking (between MP and gel) OR above pH 6 fewer bonds are breaking (between the MP and gel) (1) • below pH 7 {more PVC MP removed/more bonds break between the gel and PVC } OR above pH 7 {more PP MP removed/more bonds break between the gel and PP } (1)	ACCEPT Most/more removed (for both) between pH 4 and 6	**(2)**

Question number	Answer	Additional guidance	Mark
8(d)(ii)	An answer that includes three of the following points: • as the number of uses increases the {percentage of MPs removed/ effectiveness} decreases (1) • the effectiveness of removing PP decreases more than for PVC (1) • the gel could still be used after six times as some MP is still removed (1) • gel is still as effective for three times for PVC /for two times for PP (1) • there is a significant difference in the effectiveness for the two MP when the gel is used for the third time as error bars do not overlap (1)	DO NOT ACCEPT references to rate ACCEPT negative correlation ACCEPT there is no significant difference in effectiveness for the first two washes because the error bars overlap (1)	**(3)**