GradeMax

Pearson

Mark Scheme (Results)

Summer 2026

Pearson Edexcel International Advanced Subsidiary Level in Biology

WBI11/01

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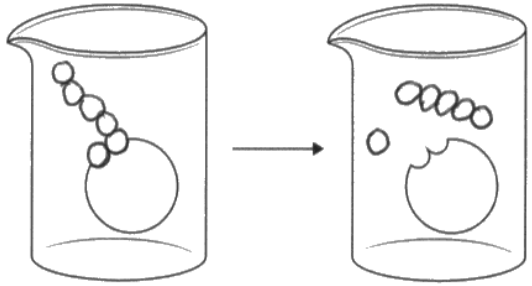
General Marking Guidance

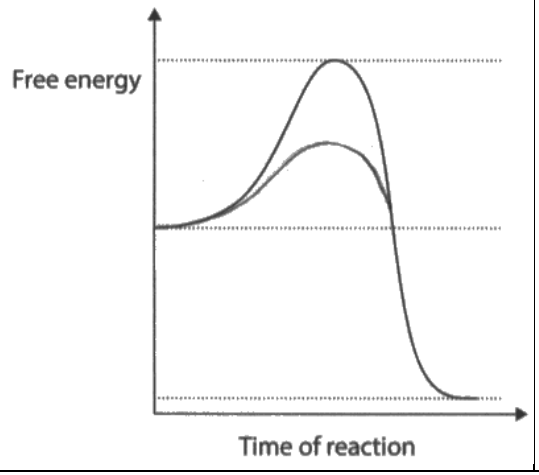
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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	Additional guidance	Mark
1(a)	A description that makes reference to the following points: • free (1) • partially permeable (1) • down (1) • concentration / mass (1)	**ACCEPT** unrestricted / polar **ACCEPT** {selectively / semi} permeable **IGNORE** along / across / through / with **DO NOT ACCEPT** up / against **ACCEPT** number / osmotic concentration / osmolarity **IGNORE** solubility / amount	**(4)**

Question number	Answer	Additional guidance	Mark
1(b)	• - 248 (kPa) (1)		**(1)**

Question number	Answer	Additional guidance	Mark
2(a)	• hydrolysis (reaction) (1)	**ACCEPT** phonetic spellings **/** catabolic / proteolysis **DO NOT ACCEPT** condensation / polymerization / denaturation	**(1)**

Question number	Answer	Additional guidance	Mark
2(b)	An answer that makes reference to the following points: • protein (with 6 circles) sitting inside active site of enzyme (1) • enzyme, and two shapes all drawn separately and apart (1)	**ACCEPT** any two circles sitting in active site – first two / second and third – from either end **ACCEPT** drawn anywhere except in the active site **NB** number of circles must match the number in the middle beaker **e.g.** 	**(2)**

Question number	Answer	Additional guidance	Mark
2(c)	An answer that makes reference to the following points: • activation energy drawn lower than value for without papain but higher than the initial energy level (1) • curve drawn in correct position in relation to line for without papain, starting and finishing on the horizontal lines (1)		**(2)**

Question number	Answer	Additional guidance	Mark
3(a)	An answer that makes reference to two of the following points: • single layer of endothelial cells (1) • permeable basement membrane / fenestrations (1) • narrow lumen (1)	**IGNORE** explanations **ACCEPT** (squamous) epithelium **IGNORE** thin {layer / epithelium} **ACCEPT** pores **IGNORE** gaps / holes / pericytes **ACCEPT** small / thin {lumen / diameter}	**(2)**

Question number	Answer	Additional guidance	Mark
3(b)(i)	An answer that makes reference to one of the following points: • platelets damaged (1) • damage to {capillary (wall) / endothelial cells / endothelium / blood vessel} (1) • {blood / platelets} comes into contact with air (1)	**ACCEPT** platelets activated / platelets triggered / platelet adhesion **ACCEPT** platelets stick to exposed collagen **IGNORE** {tissue / cell} damage	**(1)**

Question number	Answer	Additional guidance	Mark
3(b)(ii)	A description that makes reference to the following points: • thromboplastin (1) • conversion of prothrombin into thrombin (1) **OR** • thrombin (1) • conversion of (soluble) fibrinogen into (insoluble) fibrin (1)		**(2)**

Question number	Answer	Additional guidance	Mark
3(c)(i)	An answer that makes reference to three of the following points: • add heparin to the (collected) blood (1) **AND TWO FROM:** • {time / measure} how long it takes the blood to clot (1) • credit details for an *in vitro* method that would work (1) • repeat (for each concentration of heparin) and calculate a mean (1)	e.g. heparin added immediately, same blood donor, water used as a control, use blood from person with no clotting issues, e.g. of appropriate control variable	**(3)**

Question number	Answer	Additional guidance	Mark
3(c)(ii)	An answer that makes reference to the following points: • to prevent the blood from clotting / as heparin is an anticoagulant (1) • therefore blood will flow (through proboscis) (1)	**ACCEPT** slows down blood clotting / increases clotting time **ACCEPT** stay fluid / can drink the blood / feed for longer / proboscis not blocked / feed as much as possible / more blood available **IGNORE** easier	**(2)**

Question number	Answer	Mark
4(a)(i)	**The only correct answer is C** ***A*** *is incorrect because A binds with T and C binds with G* ***B*** *is incorrect because A binds with T and C binds with G* ***D*** *is incorrect because A binds with T and C binds with G*	**(1)**

Question number	Answer	Mark
4(a)(ii)	**The only correct answer is A** ***B*** *is incorrect because K is a phosphodiester bond and L is a hydrogen bond* ***C*** *is incorrect because J is a covalent bond, K is a phosphodiester bond and L is a hydrogen bond* ***D*** *is incorrect because J is a covalent bond, K is a phosphodiester bond and L is a hydrogen bond*	**(1)**

Question number	Answer	Additional guidance	Mark
4(b)(i)	An answer that makes reference to the following points: • three {bases / nucleotides} code for one amino acid (1) • specific example given (1)	**ACCEPT** corresponds / results in **IGNORE** three letters **DO NOT ACCEPT** three codons three bases make up an amino acid e.g. UUA for leucine	**(2)**

Question number	Answer	Additional guidance	Mark
4(b)(ii)	An answer that makes reference to the following points: • each base is only {read / used} once / three bases read and then the next three bases / one base is only part of one {triplet / code} / codons do not share bases (1) • specific example given (1)	**ACCEPT** nucleotides for bases **ACCEPT** each codon is read in discrete units codons are not read in sliding frames / one triplet read and then the next triplet **IGNORE** transcribed each triplet is read once letters **DO NOT ACCEPT** codons for bases e.g. UUA and then UCA CUC is a triplet codon and none of these bases will be read again in the next codon	**(2)**

Question number	Answer	Additional guidance	Mark
4(b)(iii)	A description that makes reference to the following points: • difference in the first base (1) • difference in the second base (1)	e.g. leucine starts with U or C / serine starts with a U or A / none of the codes for leucine start with A / none of the codes for serine start with C **IGNORE** comparison of proportions of bases e.g. serine starts with more uracils / leucine starts with more cytosines e.g. second base in leucine is (always) {U / the same} / second base in serine is C or G	**(2)**

Question number	Answer	Mark
5(a)(i)	**The only correct answer is A** ***B*** *is incorrect because Z is the aorta* ***C*** *is incorrect because Z is the aorta* ***D*** *is incorrect because Z is the aorta*	**(1)**

Question number	Answer	Mark
5(a)(ii)	**The only correct answer is B** ***A*** *is incorrect because the dilated region is the left ventricle* ***C*** *is incorrect because the dilated region is the left ventricle* ***D*** *is incorrect because the dilated region is the left ventricle*	**(1)**

Question number	Answer	Mark
5(a)(iii)	**The only correct answer is B** ***A*** *is incorrect because thickness difference is 5 ÷ 3 = 1.67, not 3 ÷ 5* ***C*** *is incorrect because thickness difference is 5 ÷ 3 = 1.67, not (3 ÷ 5) × 14* ***D*** *is incorrect because thickness difference is 5 ÷ 3 = 1.67, not (5 ÷ 3) × 14*	**(1)**

Question number	Answer	Additional guidance	Mark
5(a)(iv)	An explanation that makes reference to the following points: • if the walls are less elastic they will not be able to {stretch / expand} (1) • credit a reason why ventricles cannot fill up with so much blood (1) • credit a reason why less blood is pumped out (1)	**IGNORE** recoil e.g. smaller volume because (left) ventricle has {a smaller volume / smaller size / will not expand so much} e.g. if there is less blood in the {ventricles / heart} there will not be so much to pump out smaller volume pumped because {less forceful contractions of the wall / less pressure created}	**(3)**

Question number	Answer
*5(b)	**Step 1 Identifying oldest members:** • need to know when CM became present in the family • as cannot test everyone (initially) • any members of family born later could have CM • will help to build the pedigree diagram **Step 2 Pedigree diagram and records:** • pedigree diagram will help identify homozygous affected and non-affected • pedigree diagram will help to identify carriers • pedigree diagram will estimate probability of having CM • pedigree diagram will help to target the testing and the counselling • records will confirm if someone has / had CM where the pedigree diagram shows uncertainty • records will confirm the specific type of CM • impractical to test every gene **Step 3 Initial discussions:** • to discuss named examples of {social / ethical / religious / moral} {issues / implications} • so that individuals understand named example of the {procedure / advantage of knowing} • so permission can be sought **Step 4 Genetic screening:** • will confirm if someone has / had CM / carriers • specific mutations can be identified / test for relevant genes • type of CM can be determined • thus allowing specific next steps to be determined (lifestyle changes / treatment) **Step 5 Further discussions:** • patient with CM can be advised of implications of disease / reassurance • patient with CM can be given lifestyle advice • patient with CM can be given suitable medication • family members can be made aware of likelihood of having CM / being a carrier • advice on having children can be given e.gs. given } only credit once unless clear difference as to why mentioned in step 3 and step 5 **6**

			Additional guidance
Level 0	0	No awardable content	
Level 1	1-2	Demonstrates isolated elements of biological knowledge and understanding to the given context with generalised comments made. Vague statements related to consequences are made with limited linkage to a range of scientific ideas, processes, techniques and procedures. The discussion will contain basic information with some attempt made to link knowledge and understanding to the given context.	Simple discussion of strategy 1 mark = one point made 2 marks = two steps covered
Level 2	3-4	Demonstrates adequate knowledge and understanding by selecting and applying some relevant biological facts / concepts. Consequences are discussed which are occasionally supported through linkage to a range of scientific ideas, processes, techniques and procedures. The discussion shows some linkages and lines of scientific reasoning with some structure.	More detailed discussion 3 marks = three steps covered 4 marks = four steps covered
Level 3	5-6	Demonstrates comprehensive knowledge and understanding by selecting and applying relevant biological facts / concepts. Consequences are discussed which supported throughout by sustained linkage to a range of scientific ideas, processes, techniques and procedures. The discussion shows a well-developed and sustained line of scientific reasoning which is clear and logically structured.	Detailed discussion 5 marks = five steps covered 6 marks = 7 points covering 5 steps

Question number	Answer	Additional guidance	Mark
6(a)	• saturated / unsaturated / have carbon carbon double bonds / no carbon carbon double bonds **OR** (different) number of carbon carbon double bonds **OR** (different) ratio of C : H **OR** attachments of {carbohydrates / proteins} (to phospholipid / phosphate head) (1)	**IGNORE** different number of carbons / refs to cholesterol **ACCEPT** C = C for carbon carbon double bonds **ACCEPT** kinks / unkinked / more kinked **IGNORE** branched	**(1)**

Question number	Answer	Additional guidance	Mark
6(b)	An explanation that makes reference to the following points: • number between 4 and 10 to max of two dps (1) • credit method for working out width of intercellular space (1) • credit method for calculating the mean (1)	**NB** mp 2 and 3 must be awarded from their written explanation although an equation for magnification can be lifted from the working e.g. measured the width of one cell membrane to work out how many nm 1 {mm / cm} was equivalent to worked out magnification by dividing image by actual **IGNORE** gap looked the same as the two membranes e.g. measured width of intercellular space in a number of places and calculated a mean (to convert into nm) measured width of both membranes and space in a number of places and subtracted width of both membranes and calculated a mean (to convert into nm) **ACCEPT** a stated number of measurements, minimum three	**(3)**

Question number	Answer	Additional guidance	Mark
6(c)	An answer that makes reference to three of the following that includes **one difference**: **Similarities:** • both contain all the lipids (listed) (1) • both have the same percentage of PS and PL (1) • each have the same concentration of PE and the same concentration of SM (1) • both have PL as the lowest concentration (1) **Differences:** • red blood cells have higher percentage of PE, SM (PC and cholesterol) than liver cells (1) • red blood cells have more of the listed lipids than the liver cells / liver cells have more of the non-listed types of lipids (1)	**NB** need the statement not just the figures quoted **NB** need a statement not a list **IGNORE** same lipids **NB** piece together two separate statements about same percentage of PS and PL **ACCEPT** converse for liver cells **NB** piece together separate statements about higher percentage of PE and SM **ACCEPT** statements about 'others'	**(3)**

Question number	Answer	Additional guidance	Mark
6(d)	A description that makes reference to three of the following points: • linear relationship with cholesterol present (1) • {sigmoidal / S-shaped } relationship with cholesterol absent (1) • below a certain temperature membrane fluidity {increases / is} more with cholesterol present (than without cholesterol present) **OR** • above a certain temperature membrane fluidity {increases / is} more without cholesterol present (than with cholesterol present) (1)	**IGNORE** any explanation given **DO NOT ACCEPT** references to speed / rate – **penalize once** **ACCEPT** {constant / equal} increase **IGNORE** positive correlation / directly proportional **ACCEPT** description / ref to sigmoidal curve **NB ACCEPT** both increase in membrane fluidity with temperature = 1 mark if neither mp 1 nor mp 2 awarded and no mention of a rate or speed **ACCEPT** at lower temperatures / initially converse **ACCEPT** at higher temperatures / laterly converse	**(3)**

Question number	Answer	Additional guidance	Mark
7(a)	An explanation that makes reference to three of the following points: • because high blood pressure damages the {endothelial lining / endothelial cells / lining of blood vessels} (1) • resulting in an {inflammatory response / inflammation} (1) • causing formation of a {plaque / atheroma / cholesterol build up} (1) • which {reduces the flow of blood / blocks the blood vessel} (1)	**IGNORE** walls of blood vessels **ACCEPT** white blood cells accumulate in the damaged areas accumulation of foam cells **ACCEPT** blood clot **ACCEPT** narrows artery / named artery	**(3)**

Question number	Answer
*7(b)	**Graph 1:** • all three drugs reduce systolic blood pressure • drug M and N have similar reductions • drug L most {effective / decrease} (overall) Graph 2: • all three drugs reduce diastolic blood pressure • drug M and N have similar reductions • drug L most {effective / decrease} (overall) Graph 3: • all three drugs have side effects • drug N causes more women to have side effects overall • drug L causes the least number of women to have side effects **Overall:** • drug L most effective overall as it lowers both systolic and diastolic blood pressure the most and causes fewest side effects • drug N least effective overall as it lowers both systolic and diastolic blood pressure to the same extent as drug M but causes more side effects **Design of study:** • sample size is not very big, so conclusions / study is less valid • 20 to 38 weeks of pregnancy is quite a wide range so not testing when the drugs are effective • no error bars so the differences in effect may not be significant / so conclusions may not be valid / conclusions cannot be made • no information on how bad the headaches / the extent of the depression / how rapid heart rate is so cannot really make useful comparisons • drugs may cause other side effects not recorded which may contribute to lack of usefulness of drug • no control group so do not know if it is the drug / the solvent having the effect / placebo effect / happens anyway in the person • lack of information on other lifestyle factors that may be affecting blood pressure e.g. smoking, stress • 72 hours not long enough to determine long term effects • lack of information about other variables {affects / decreases} {validity of study / validity of conclusions} **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 descriptions of data 1 mark = descriptions from one graph or one relevant comment 2 marks = descriptions from all graphs
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.	Simple comparisons with some consideration of design of study 3 marks = simple comparisons of drug effectiveness **OR** descriptions from all graphs **AND** description of limitations of study 4 marks = simple comparisons of drug effectiveness **PLUS** description of limitations of study
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.	Full evaluation of results and study design 5 marks = overall conclusion on drug effectiveness and **ONE** implication of design discussed 6marks = overall conclusion on drug effectiveness and **TWO** implications of design discussed

Question number	Answer	Mark
7(c)(i)	**The only correct answer is A** ***B*** *is incorrect because 2.16 ÷ 9.24 = 0.2337, therefore 1 : 0.23* ***C*** *is incorrect because 2.16 ÷ 9.24 = 0.2337, therefore 1 : 0.23* ***D*** *is incorrect because 2.16 ÷ 9.24 = 0.2337, therefore 1 : 0.23*	**(1)**

Question number	Answer	Mark
7(c)(ii)	**The only correct answer is B** ***A*** *is incorrect because 100 ÷ 15 = 6.666666666666666666666666667 = 6.7* ***C*** *is incorrect because 100 ÷ 15 = 6.666666666666666666666666667 = 6.7* ***D*** *is incorrect because 100 ÷ 15 = 6.666666666666666666666666667 = 6.7*	**(1)**

Question number	Answer	Additional guidance	Mark
7(c)(iii)	An explanation that makes reference to the following points: • credit one reason (1) • credit use of graph (1)	e.g. • coffee has high antioxidant, but you have to drink a lot of it (1) • values are given for coffee beans not for the drink (1) **OR** • no error bars to show if differences are significant (1) • an example from graph e.g. if coffee had large error bar it may be similar in content to blueberries (1) **OR** • values given per 100g but different masses of each food get consumed • e.g. 15g of coffee in a drink but more blueberries (in a portion) might get eaten **OR** • not all antioxidants in the foods are consumed • pips in grapes may make them weigh heavier than blueberries but not contain antioxidants **OR** • values above the bars are misleading • as they look like the number of grams **OR** • the scale on the graph is not large enough to judge difference • e.g. strawberries and green tea look the same but green tea has more **OR** • different types of each food may vary in antioxidant content **OR**	**(2)**

		• antioxidants lost in food {preparation / storage / examples of methods}	

Question number	Answer	Additional guidance	Mark
7(c)(iv)	An answer that makes reference to the following points: • {milk / milk component} could {bind to / react with / breakdown} the antioxidant (1) • milk will be digested (in the gut) (1)	**NB** ignore other reasons given unless contradicts mark being awarded **ACCEPT** antioxidants neutralise free radicals in milk **IGNORE** dissolves / enzymes **ACCEPT** the converse of mp 1 if mp 1 has not been awarded	**(2)**

Question number	Answer	Additional guidance	Mark
8(a)	• total number of babies = 184 391 / correct answer with correctly rounded decimal places / 3.0 (1) • 3 (1)	3.073183333 Bald answer = 2 marks	**(2)**

Question number	Answer	Additional guidance	Mark
8(b)	An answer that makes reference to the following points: • genotypes of both parents given as a lower case and upper case of same letter e.g. Cc (1) • gametes shown as e.g. C and c (1) • offspring genotypes given as e.g. CC, Cc, Cc and cc (1) • probability given as {50:50 / 1 : 1 / half / 50% / 0.5 / ½ / 1 in 2} (1)	ecf throughout for wrong parent genotypes **NB** XX and XY can potentially only score mp 2	**(4)**

Question number	Answer	Mark
8(c)(i)	**The only correct answer is C** ***A*** *is incorrect because fructose molecules are produced* ***B*** *is incorrect because fructose is not a monomer of lactose* ***D*** *is incorrect because water is used in a hydrolysis reaction not produced*	**(1)**

Question number	Answer	Additional guidance	Mark
8(c)(ii)	An explanation that makes reference to five of the following points: • because a mutation (in the gene) would change the {base / <u>base</u> sequence} (1) • which may cause a stop codon to be {made / read} (1) • therefore (m)RNA will have a stop codon (1) • there will be no tRNA to bind to the stop codon / translation will end at the stop codon (1) • (shortened) lactase {will not fold correctly / will form different bonds / will have different interactions} (1) • {incorrectly shaped / changed} active site {will not bind / is not complementary / cannot fit with} to lactose (1)	**ACCEPT** description e.g. one base is swapped with another, add a base, remove a base **IGNORE** frameshift **DO NOT ACCEPT** transcription **ACCEPT** ESC will not form provided it is related to lactose	**(5)**

Question number	Answer	Additional guidance	Mark
8(d)	An explanation that makes reference to the following points: • credit reason for levels of glucose increasing (in the negative test) (1) • credit reason for levels of glucose decreasing (in the negative test) (1) • credit reason for levels staying the same (in positive test) (1)	e.g. because lactose gets broken down into glucose and then {is absorbed / moves into blood} e.g. all lactose has been broken down glucose is removed from blood glucose is used e.g. some of the lactose is broken down (and absorbed) glucose already present (blood / gut) other carbohydrates broken down	**(3)**