Pearson

Mark Scheme (Results)

Summer 2026

Pearson Edexcel Advanced Subsidiary in Biology A Salters Nuffield

8BN0/01

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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	Mark
1(a)(i)	C – overweight • *A is incorrect because BMI of 28 is overweight and not underweight* • *B is incorrect because BMI of 28 is overweight and not normal weight* • *D is incorrect because BMI of 28 is overweight and not obese*	**(1)**

Question Number	Answer	Mark
1(a)(ii)	C –height^2 and mass • *A is incorrect because BMI is calculated using mass and height^2* • *B is incorrect because BMI is calculated using mass and height^2* • *D is incorrect because BMI is calculated using mass and height^2*	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)	An answer that makes reference to the following: • high / increased (risk of coronary heart disease) plus one from: • because they drink {21 (units) / more alcohol than recommended} (1) • because they are {overweight / abdominally obese} (1)	IGNORE at risk unqualified ALLOW medium ALLOW 21>14 REJECT incorrect justifications regarding low alcohol intake ALLOW {0.95 / W:H}>0.9 IGNORE 0.95 unqualified ALLOW they are obese	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(c)	An answer that makes reference to two of the following: • (blood test to) analyse (blood) cholesterol levels / analyse LDL level / HDL:LDL (1) • (measure) blood pressure (1) • ECG (1)	IGNORE blood test unqualified IGNORE lipids / fats IGNORE measure heart rate IGNORE hereditary test / family history	**(2)**

Question Number	Answer	Mark
2(a)(i)	C - TAC GAC CCC AAT TCA GTC TGC ATG • *A is incorrect because the first base would be T* • *B is incorrect because the first base would be T* • *D is incorrect because DNA does not contain uracil*	**(1)**

Question Number	Answer	Mark
2(a)(ii)	D - phosphodiester • *A is incorrect because disulfide bonds do not join nucleotides* • *B is incorrect because glycosidic bonds do not join nucleotides* • *C is incorrect because peptides do not join nucleotides*	**(1)**

Question Number	Answer	Mark
2(a)(iii)	D – nucleus and RNA polymerase • *A is incorrect because transcription does not occur in the cytoplasm* • *B is incorrect because transcription does not occur in the cytoplasm* • *C is incorrect because DNA polymerase is not involved in transcription*	**(1)**

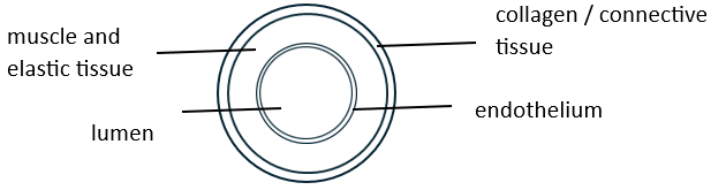
Question Number	Answer	Additional Guidance	Mark
2(b)(i)	<table><tr><td>AUG</td><td>CUG</td><td>GGG</td><td>UUA</td><td>AGU</td><td>CAG</td><td>ACG</td><td>UAC</td></tr><tr><td>Start</td><td>Leu</td><td>Gly</td><td>Leu</td><td>Ser</td><td>Gln</td><td>Thr</td><td>Tyr</td></tr></table>	all correct = 1 mark	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	An explanation that makes reference to the following: • change in the {second / second and third} base (of codon) / change to {UAA / UAG / UGA} (1) • {UAA / UAG / UGA} codes for a stop (codon) (1) • which would {stop / prevent further} translation / polypeptide chain would be released (from ribosome) early / no further {amino acid / peptide bonds} would be added (1)	ALLOW {addition / deletion / substitution / replacement} of base(s) IGNORE removal of (entire) codon IGNORE codes for different amino acid reject codes for stop amino acid ALLOW stop codon is now read earlier reject stop transcription	**(3)**

Question Number	Answer	Additional Guidance	Mark
3(a)	An explanation that makes reference to three of the following: • large surface area to volume ratio (1) • can rely on diffusion for gas exchange / diffusion is sufficient to meet demand for oxygen (1) • low {metabolic / respiration} rate (1) • short diffusion distance (to centre of body) (1) • (diffusing) from a high(er) concentration to a low(er) concentration / down a concentration gradient (1)	reject contradictions ALLOW (sufficient) oxygen / carbon dioxide} diffuses {into worm / out of worm / to cells / through skin} ALLOW diffusion is sufficient to meet metabolic demand	**(3)**

Question Number	Answer	Additional Guidance	Mark
3(b)	An explanation that makes reference to four of the following: • large numbers of alveoli give a (very) large surface area (1) • large numbers of capillaries give a (very) large surface area (1) • {one (epithelial) cell thick walls / flattened cells} of the alveoli give a short distance for diffusion (1) • {(alveolus) very close to a capillary / one (endothelial) cell thick capillary wall} gives a short distance for diffusion (1) • concentration gradient maintained by constant {blood flow / inhalation and exhalation} (1)	ALLOW each alveolus {is folded to increase / has large} surface area ALLOW capillary network around alveoli increases surface area for gas exchange ALLOW squamous epithelium gives a short distance for diffusion ALLOW thin walls give a short diffusion distance IGNORE 1 cell thick IGNORE 1 cell thick ALLOW good blood supply ensures concentration gradient maintained ALLOW {surfactant / dissolving of gases in liquid} increases rate of diffusion	**(4)**

Question Number	Answer	Mark
4(a)(i)	D – pulmonary vein and oxygenated • *A is incorrect because Y is not the pulmonary artery* • *C is incorrect because Y is not the pulmonary artery* • *D is incorrect because the blood is not deoxygenated in Y*	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(a)(ii)	An answer that makes reference to the following: • lumen labelled correctly (1) • endothelium (drawn and) labelled correctly (1) • (smooth) muscle and elastic tissue layer drawn and labelled correctly (1) • {collagen / connective tissue} layer drawn and labelled correctly (1)	 ALLOW correct labels e.g. tunica interna/ intima / (inter)media / externa ALLOW separate layers for elastic and muscle tissue	**(4)**

Question Number	Answer	Additional Guidance	Mark
4(a)(iii)	A description that makes reference to four of the following: • atrial systole / contraction of (left) atrium (cardiac) muscle (1) • {blood / pressure} opens AV valve / blood enters (left) ventricle (1) • ventricular systole / contraction of (left) ventricle (cardiac) muscle (1) • {blood / pressure} opens semilunar valve / pressure moves blood into {aorta / X} (1) • AV valve closes to ensure blood enters {aorta / X} (1)	ALLOW blood moves from high to low pressure / pressure is higher in atrium (than ventricle) ALLOW blood moves through semilunar valve (into blood vessel) / pressure is higher in ventricle (than in {aorta / X}) ALLOW AV valve closes to prevent backflow of blood (into atria) IGNORE closing of semi-lunar valve	**(4)**

Question Number	Answer	Additional Guidance	Mark
4(b)(i)	• correctly plotted point		**(1)**

Question Number	Answer	Additional Guidance	Mark
4(b)(ii)	An answer that makes reference to the following: • positive correlation between (mean) heart mass and (mean) body mass	ALLOW the larger the (mean) body mass, the larger the (mean) heart mass / converse ALLOW the pig has the highest body mass and heart mass / the dog has the lowest body mass and heart mass	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(b)(iii)	An answer that makes reference to the following: • correct division using values read from graph and converted to same unit (1) • correct calculation of percentage (1)	<u>Example of calculation</u> $0.120 \div 20 = 0.006 / 6 \times 10^{-3}$ OR $120 \div 20\,000 = 0.006 / 6 \times 10^{-3}$ $0.006 \times 100 = 0.6$ (%) ALLOW correct standard form no ECF Correct answer with no working scores full marks	**(2)**

Question Number	Answer	Additional Guidance	Mark
5(a)	A description that makes reference to the following: • prothrombin is converted to thrombin (1) • {thrombin binds to fibrinogen / enzyme substrate complex formed between thrombin and fibrinogen} and fibrin is produced (1)	ALLOW {thrombin / enzyme} catalyses the conversion of fibrinogen to fibrin ALLOW {thrombin / enzyme} converts fibrinogen to fibrin reject thromboplastin / prothrombin	**(2)**

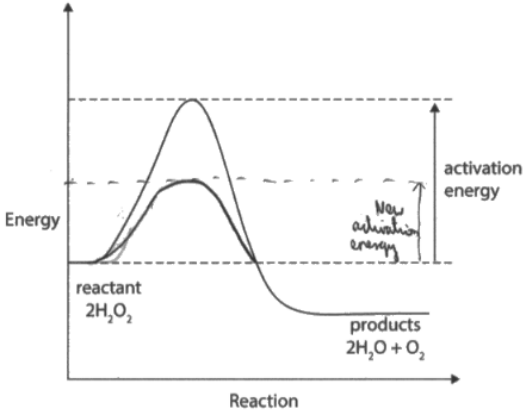
Question Number	Answer	Additional Guidance	Mark
5(b)	An explanation that makes reference to three of the following: Benefits (max two): • prevents {heart attack / death of heart cells} (1) • by inhibiting platelets which are involved in blood clotting / stops platelets sticking together / prevents blood clots forming (1) • (because with no blood clot) coronary artery can supply {oxygen / glucose} to {cardiac / heart} muscle cells (1) Risk: • correct risk identified (1)	IGNORE reduces CVD risk ALLOW reduces risk of heart attack ALLOW {reduces / slows} formation of blood clots / reduces stickiness of platelets ALLOW converse IGNORE body cells e.g. blood does not clot if any blood vessels are damaged / excessive bleeding / haemorrhage, diarrhoea, dizziness, headaches IGNORE thin blood	**(3)**

Question Number	Answer	Additional Guidance	Mark
5(c)(i)	An answer that makes reference to the following: • vitamin C concentration decreases {as storage time increases / over time} (1) • vitamin C concentration decreases {faster at higher storage temperatures / slower at lower temperatures} (1)	no converse ALLOW (for the same storage time) the higher the temperature, the lower the vitamin C concentration / converse ALLOW {20°C / cooler temperatures} is best for {maintaining / preserving} the vitamin C concentration	**(2)**

Question Number	Answer	Additional Guidance	Mark
5(c)(ii)	An answer that makes reference to the following: • correct difference in vitamin C concentration after 20 hours calculated from values from graph (1) • correct percentage difference to two significant figures (1)	<u>Example of calculation</u> {170 to 165} – {40 to 35} = correct difference e.g. 170-35 = 135 e.g. (135 ÷ 102.5) × 100 = 130% e.g. (130 ÷ 105) × 100 = 120% ALLOW standard form to 2 sig fig e.g. 1.3×10^2 no ECF for incorrect values Correct answer with no working scores full marks	**(2)**

Question Number	Answer	Additional Guidance	Mark
5(d)	An answer that makes reference to the following: • correct mass of vitamin C in mg (1) • mass converted to µg (1)	<u>Example of calculation</u> (6 ÷ 11.56) = 0.5190311 / 0.52 0.52 × 1000 = 519.03 or 519 or 520 or 5.2 x 10^2 (µg) alternative method is 6000÷ 11.56 = 519 so ALLOW 6 converted to 6000 for 1 mark Correct answer with no working scores full marks	**(2)**

Question Number	Answer	Additional Guidance	Mark
6(a)	An answer that makes reference to three of the following: Similarities (max two) • both are globular proteins (1) • both contain four {polypeptides / chains / subunits} • both contain (four) haem groups (1) Difference • catalase enzyme has an active site whereas haemoglobin does not / haemoglobin has oxygen binding sites and catalase does not (1) • catalase contains identical {polypeptides / subunits} whereas haemoglobin contains {two different types / two α and two β} (subunits) (1)	do not piece together ALLOW both have a quaternary structure IGNORE tertiary structure ALLOW both contain chains of amino acids ALLOW catalase contains identical {polypeptides / subunits} whereas haemoglobin does not	**(3)**

Question Number	Answer	Additional Guidance	Mark
6(b)	An answer that makes reference to the following: • suitable line drawn	Example of graph:  Annotation not required	**(1)**

Question Number	Answer	Additional Guidance	Mark
6(c)(i)	An answer that makes reference to one of the following: • {measuring cylinder / gas syringe} because the **volume** of oxygen can be measured (1) • gas syringe so oxygen does not dissolve in the water (1)	IGNORE **amount** of oxygen	**(1)**

Question Number	Answer	Additional Guidance	Mark
6(c)(ii)	An answer that makes reference to the following: • at least five different {hydrogen peroxide / H_2O_2} concentrations (1) • suitable controlled variable relating to {H_2O_2 / catalase} (1) • controlled {temperature / pH} (1) • performing repeats and calculating mean (1) • description of how initial rate of reaction would be calculated (1)	can piece together e.g. volume of H_2O_2 / controlled {concentration / volume / mass / surface area / source} of catalase ALLOW reference to use of buffer ALLOW repeats to calculate an average e.g. calculating gradient at {start / steepest part} of graph IGNORE gradient unqualified	**(5)**

Question Number	Answer	Additional Guidance	Mark
7(a)(i)	An answer that makes reference to the following: • glycolipid labelled and drawn with carbohydrate chain added to head of phospholipid (1) • glycoprotein labelled and drawn with carbohydrate chain added to (extrinsic) protein molecule (1)		**(2)**

Question Number	Answer	Mark
7(a)(ii)	B – cholesterol • *A is incorrect because X is not a carbohydrate* • *C is incorrect because X is not an extrinsic protein* • *D is incorrect because X is not a phospholipid*	**(1)**

Question Number	Answer	Additional Guidance	Mark
7(a)(iii)	{regulates / maintains} the {fluidity / flexibility / stability / rigidity} (of the membrane)	ALLOW cholesterol maintains structural integrity (of the membrane) ALLOW cholesterol {decreases / regulates} permeability of membrane ALLOW {increases / decreases the {fluidity / flexibility / stability / rigidity} (of the membrane) IGNORE cholesterol increases permeability of membrane	**(1)**

Question Number	Answer	Additional Guidance	Mark
7(b)(i)	An answer that makes reference to four of the following: Similarities • both have glycerol and fatty acid (1) • both have ester bonds (1) Differences • monoglyceride has one {fatty acid / ester bond} whereas phospholipid has two (1) • phospholipid has a phosphate group whereas monoglyceride does not (1) • monoglyceride has {no C=C / saturated fatty acid} whereas unsaturated phospholipid has {C=C / unsaturated fatty acid} (1)	ignore {hydrocarbon / carbon} chain ALLOW **only** phospholipid has a phosphate group ALLOW monoglyceride has higher H:C ratio than unsaturated lipid / lower C:H ratio / converse ALOW monoglyceride has no kink (in the chain) whereas unsaturated phospholipid has kink (in the chain)	**(4)**

Question Number	Answer	Additional Guidance	Mark
7(b)(ii)	An answer that makes reference to four of the following: • monoglyceride is {non-polar / lipid soluble} (1) • therefore (monoglyceride) diffuses (through phospholipid bilayer) (1) • monosaccharide is {polar / (water) soluble / large} (1) • therefore (monosaccharide) enters via {facilitated diffusion / active transport} (1) • (rate that monosaccharide enters cells is) limited by the number of {protein channels / carrier proteins} (1)	ALLOW simple diffusion reject facilitated diffusion ALLOW – transport via {protein channels / carrier proteins} ALLOW limited by the number of {GLUT / glucose transporter}	**(4)**

Question Number	Answer	Additional Guidance	Mark
8(a)(i)	An answer that makes reference to three of the following: • incorrect conclusion / they are not homozygous recessive (1) • because {child 7 / one of their children} is unaffected (1) • (brachydactyly) is {a dominant condition / caused by a dominant allele} (1) • individuals 1 and 2 are heterozygous / one parent is heterozygous and one parent is homozygous dominant (1)	ALLOW child 7 is homozygous recessive ALLOW if {they were both homozygous recessive / student's conclusion was correct} then all the children would have {the condition / brachydactyly / 2 recessive alleles} IGNORE gene reject one of parents is heterozygous and one is homozygous recessive IGNORE at least one parent is heterozygous	**(3)**

Question Number	Answer	Additional Guidance	Mark
8(a)(ii)	An answer that makes reference to the following: • {chorionic villus sampling / CVS / amniocentesis} (test would be used) (1) • (increased) risk of miscarriage (1) • relevant ethical issue associated with risk of false {positive / negative} (1)	IGNORE PGD / CVD / chronic villus sampling IGNORE harm fetus e.g. Ethical issue of false positive could be terminating healthy fetus	**(3)**

Question Number	Answer	Additional Guidance	Mark
8(b)	• correct gametes in Punnett square (1) • correct offspring genotypes (1)	Example of genetic diagram <table><tr><td></td><td>C^R</td><td>C^R</td></tr><tr><td>C^W</td><td>$C^R C^W$</td><td>$C^R C^W$</td></tr><tr><td>C^W</td><td>$C^R C^W$</td><td>$C^R C^W$</td></tr></table>gametes could be either way around alleles could be either way around no ECF DO NOT ALLOW alleles without C DO NOT ALLOW C^{RW} for mp2 DO NOT ALLOW C^r or alternative alleles	**(2)**

Question Number	Answer	Mark
8(c)(i)	B – 20 • *A is incorrect because 50 000 ÷ 2 500 is not 2* • *C is incorrect because 50 000 ÷ 2 500 is not 200* • *D is incorrect because 50 000 ÷ 2 500 is not 2000*	**(1)**

Question Number	Answer
***8(c)(ii)**	Answers will be credited according to candidate's knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. • consideration of effect of treatments {A/B/C} • treatment B is most beneficial • supplements result in increased {digestion / enzyme -substrate complexes}/ converse for no supplements • increasing diet content without increasing enzymes would not help • relevant comment regarding graph e.g. carbohydrase increases blood glucose / consideration of significant difference on graph due to non-overlapping {error / SD} bar • carbohydrase releases glucose / carbohydrates broken down into glucose • {lipase releases / lipids broken down into} fatty acids and glycerol • {protease releases / proteins broken down into} amino acids • {carbohydrates / glucose / monosaccharides / lipids} needed for {respiration / ATP production / glycogen / energy storage} • {amino acids / protein} are needed for {protein synthesis / growth} • {lipids / fatty acids and glycerol} needed {to form phospholipids / to form cell membranes / for insulation / increased absorption of fat-soluble vitamins} • therefore more {energy / ATP} available for {growth / mitosis / metabolic demands / other named processes} • therefore increased growth rate of child / increased rate of {mitosis / cell division} • individuals with CF {produce {thick / sticky} mucus / have blocked pancreatic duct} • consideration of why more energy used by immune system linked to effects of CF on lungs 6 marks

Level	Marks		Additional Guidance
1	1-2	An explanation may be attempted but with limited interpretation or analysis of the scientific information 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.	A basic consideration of at least one treatment from table. Plus one of: • B is best treatment • function of enzyme supplement / description of graph / converse for no supplements • products of digestion • purpose of products of carbohydrate digestion • purpose of products of protein digestion • purpose of products of lipid digestion • reason CF causes less pancreatic enzymes to be secreted
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.	Includes recognition of treatment B as most beneficial Plus {one / two} from • function of enzyme supplement / description of graph / converse for no supplements • products of digestion • purpose of products of carbohydrate digestion • purpose of products of protein digestion • purpose of products of lipid digestion • reason CF causes less pancreatic enzymes to be secreted / CF lungs linked to immune system
3	5-6	An explanation is made which 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, coherent and logically structured.	Includes recognition of treatment B as most beneficial Plus {three / four} from the aspects in level 2 box

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