



Mark Scheme (Results)

Summer 2019

Pearson Edexcel International Advanced Level
In Biology (WBI01) Paper 01
Lifestyle, Transport, Genes and Health

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Summer 1906

Publications Code WBI01_01_1906_MS

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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)	<p>The only correct answer is C 3</p> <p><i>A is incorrect because lactose maltose and sucrose are disaccharides</i> <i>B is incorrect because lactose maltose and sucrose are disaccharides</i> <i>D is incorrect because lactose maltose and sucrose are disaccharides</i></p>	(1)
Question Number	Answer	Mark
1(a)(ii)	<p>The only correct answer is C hydrolysis</p> <p><i>A is incorrect because the reaction involves hydrolysis</i> <i>B is incorrect because the reaction involves hydrolysis</i> <i>D is incorrect because the reaction involves hydrolysis</i></p>	(1)
Question Number	Answer	Mark
1(b)(i)	<p>The only correct answer is A more hydrogen atoms</p> <p><i>B is incorrect because the saturated lipid has more hydrogen atoms</i> <i>C is incorrect because the saturated lipid has more hydrogen atoms</i> <i>D is incorrect because the saturated lipid has more hydrogen atoms</i></p>	(1)

Question Number	Answer	Mark
1(b)(ii)	<p>The only correct answer is D C=O only</p> <p><i>A is incorrect because saturated lipids only have C-O bonds</i></p> <p><i>B is incorrect because saturated lipids only have C-O bonds</i></p> <p><i>C is incorrect because saturated lipids only have C-O bonds</i></p>	(1)

Question Number	Answer	Additional Guidance	Mark
1(c)	<p>1. starch is a glucose polymer / eq;</p> <p>2. (therefore) stores lots of energy;</p> <p>3. starch / amylopectin {is branched / eq};</p> <p>4. (therefore) starch is {quickly / eq} {hydrolysed / broken down};</p> <p>5. starch is compact;</p> <p>6.(therefore) more glucose can be stored in a {smaller space / given volume / eq};</p>	<p>Two descriptions (odd mark points) and one explanation (even mark points) needed for full marks mp1 ACCEPT-many (α) glucose molecules joined together / starch is a polysaccharide</p> <p>MP3 ACCEPT many terminal ends/side chains IGNORE coiled</p> <p>Mp4 IGNORE -easily IGNORE -ref to chains "breaking off" or releasing energy</p> <p>mp6 NOT energy stored in a smaller space</p>	(3)

Question Number	Answer	Additional Guidance	Mark
1(d)(i)	1. as daily intake of starch increases the incidence of colon cancer decreases / eq ;	ACCEPT converse ACCEPT negative correlation / inversely proportional	(1)

Question Number	Answer	Additional Guidance	Mark
1(d)(ii)	1. women have a lower daily energy {intake / requirement} than men / eq ;	ACCEPT converse ACCEPT a comment on difference in activity	(1)

Question Number	Answer	Additional Guidance	Mark
1(d)(iii)	1. in general men have a higher risk than women/eq ; 2. correctly manipulated data used to support mp1 ; 3. China correctly identifies as the exception ;	Mp1 ACCEPT converse mp1 ACCEPT 4/5 countries/almost every country mp2 USA 15 times / UK 4 times / Finland x2 / India x1 or 1.5 higher in men (per 100 000 population)	(3)

Question Number	Answer	Additional Guidance	Mark
2(a)	<ol style="list-style-type: none">1. increasing temperature increases heart rate;2. temperature affects the {metabolism / respiration / enzyme activity / eq};3. increasing temperature causes an increase in kinetic energy / eq ;4. this leads to more collisions / eq between enzymes and substrates;5. more ESCs formed / eq ;6.(heart rate increasing) supplies more {oxygen / glucose / eq};	ACCEPT positive correlation mp2 ACCEPT ref to rate of reaction if in context of enzymes mp6 IGNORE ref to blood supply only	(4)

Question Number	Answer	Additional Guidance	Mark
2(b)	<p>1. repeat on more <i>Daphnia</i> / eq (at each temperature) ;</p> <p>2. use same {size / species / type / mass / age / eq} of <i>Daphnia</i> ;</p> <p>3. control of a named abiotic variable (other than temperature) ;</p> <p>4. use a standardised method to count heart beats for a specified time / description of method ;</p>	<p>IGNORE repeat using same <i>Daphnia</i>/repeat only IGNORE refs to using a wider or narrower range of temperature mp2-IGNORE similar mp2 ACCEPT from same source / location mp3 eg volume of water / pH / acclimatisation time IGNORE acclimatise only mp4 eg dots on paper and count for a specified time</p>	(2)

Question Number	Answer	Additional Guidance	Mark
2(c)	<ol style="list-style-type: none">1. they are transparent / have a visible {heart / organs / eq} ;2. they are {simple organisms / do not feel pain / have a simple nervous system / eq} ;3. idea that they are cheap / easy to obtain / abundant / eq ;	MP2 IGNORE comments on ethics unless qualified mp2 IGNORE -invertebrates/no backbone	(2)

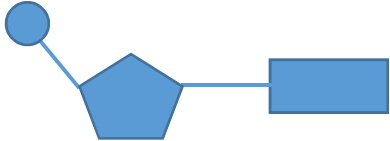
Question Number	Answer	Additional Guidance	Mark
3(a)	peptide ;	ACCEPT amide	(1)

Question Number	Answer	Additional Guidance	Mark
3(b)	1. both parents correctly drawn ; 2. all four offspring correctly drawn ;	IGNORE Punnet squares Marks are independent	(2)

Question Number	Answer	Additional Guidance	Mark
3(c)(i)	1. amniocentesis / chorionic villus sampling / CVS ; 2. correct location of sample obtained ; 3. correct timescale for procedure in weeks: 4. identify/test {the mutated / eq} {gene / allele / DNA / eq}; OR culture the cells obtained :	Mp1 ACCEPT chronic A testing for sampling MP2 amniotic fluid, placenta Mp3 must be a stated week within the range or correct range (amniocentesis 14 to 20 or CVS 8 to 14)	(4)

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	1. idea that there may not be a family history of this condition ; 2. idea of {cost being high / lack of availability of testing} ; 3. risks to fetus ;	IGNORE refs to religion / ethics MP1 ACCEPT 'it is a rare condition' IGNORE ref to parents are carriers	(2)

		mp3 ACCEPT embryo IGNORE baby / child / offspring ACCEPT risk of miscarriage / spontaneous abortion IGNORE abortion only	
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Question Number	Answer	Additional Guidance	Mark
4(a)	1. correct location of the base ; 2. correct location of phosphate ;		(2)

Question Number	Answer	Mark
4(b)(i)	The only correct answer is B 83 <i>A is incorrect because it is a triplet code</i> <i>C is incorrect because it is a triplet code</i> <i>D is incorrect because it is a triplet code</i>	(1)

Question Number	Answer	Mark
4(b)(ii)	The only correct answer is B 32.5% <i>A is incorrect because $100 - (17.5 \times 2) / 2 = 32.5$</i> <i>C is incorrect because $100 - (17.5 \times 2) / 2 = 32.5$</i> <i>D is incorrect because $100 - (17.5 \times 2) / 2 = 32.5$</i>	(1)

Question Number	Answer	Additional Guidance	Mark
4(c)	<ol style="list-style-type: none">1. reference to transcription and translation ;2. credit complementary mRNA strand formed ;3. mRNA moves {into the cytoplasm / out of the nucleus} ;4. mRNA associates with ribosomes ;5. idea of specificity of tRNA for a particular amino acid ;6. credit appropriate anticodon on tRNA interacting complementary codon on mRNA ;7. formation of peptide bond (between amino acids) ;	Do not accept-RNA only MP1- credit anywhere in the answer MP2 e.g. UGG CUG AA	(5)

Question Number	Answer	Additional Guidance	Mark
5(a)	1. there are other risk factors/eq ;	Do not accept 'more than one / eq factor involved' as repeating stem ACCEPT correctly named risk factor e.g. age / gender / high blood pressure / genetics/genes IGNORE references to HDLs or LDLs	(1)

Question Number	Answer	Additional Guidance	Mark
5(b)	1. BMI identified as 25 ; 2. 92.16 / 92.2 / 92 (kg) ;	Correct answer only scores 2 marks no ecf from mp1 Do not accept '92.1'	(2)

Question Number	Answer	Additional Guidance	Mark
5(c)(i)	1. (plant) statin ; 2. muscle pain / liver damage / kidney failure / nausea / dizziness / headache etc;	Accept named examples of statins mp2 ACCEPT -depression IGNORE -too low cholesterol	(2)

Question Number	Answer	Additional Guidance	Mark
*5(c)(ii)	<ol style="list-style-type: none"> 1. idea of {energy imbalance / eq} leading to obesity ; 2. (high LDL levels/eq) leads to {damage to the endothelium / lining} of artery ; 3. reference to or description of inflammatory response ; 4. (leads to) formation of {atheroma / plaque / atherosclerosis} ; 5. (leads to) a {loss of elasticity / narrowing of lumen / blockage} of artery ; 6. leads to a reduced blood flow to {heart / cells / tissues} ; 7. (causing) reduced amount of {oxygen /glucose/nutrients} to reach the{heart / tissues/cells/eq} ; 	<p>QWC emphasis is logical sequence</p> <p>MP2 Do not accept artery wall ACCEPT endothelial cells / wall/layer IGNORE blood vessel only</p> <p>MP3-deposition of LDLs or cholesterol / WBCs / platelets / foam cells / calcium salts mp3 IGNORE -clotting cascade only</p> <p>mp5-IGNORE narrow artery only</p>	(5)

Question Number	Answer	Mark
6(a)(i)	<p>The only correct answer is B 1</p> <p><i>A is incorrect because only active transport uses protein pumps and ATP</i> <i>C is incorrect because only active transport uses protein pumps and ATP</i> <i>D is incorrect because only active transport uses protein pumps and ATP</i></p>	(1)

Question Number	Answer	Mark
6(a)(ii)	<p>The only correct answer is A 0</p> <p><i>B is incorrect because none involve passive transport and movement against a concentration gradient</i> <i>C is incorrect because none involve passive transport and movement against a concentration gradient</i> <i>D is incorrect because none involve passive transport and movement against a concentration gradient</i></p>	(1)

Question Number	Answer	Additional Guidance	Mark
6(b)	<ol style="list-style-type: none"> they both involve formation of a {vesicle / eq} ; endocytosis takes substances {into / eq} the cell and exocytosis {removes / eq} substances from the cell ; both need {energy / ATP / active transport} ; 	<p>Mp1 ACCEPT correct description of a vesicle formation</p> <p>mp2- ACCEPT inside of/outside of cell</p>	(2)

Question Number	Answer	Additional Guidance	Mark
6(c)(i)	1. as temperature increases more pigment is lost ; 2. from 65 (to 80) there is no further effect / eq ;	Mp1 IGNORE -ref to colour intensity MP2 ACCEPT reaches a maximum / stays constant after 65 mp2 IGNORE -optimum temp	(2)

Question Number	Answer	Additional Guidance	Mark
6(c)(ii)	1. <i>as the temperature increases, the membrane permeability increases ;</i> 2. <i>so pigments {diffuse /leak/move/eq} out ;</i> 3. <i>(as temperature increases) kinetic energy increases movement (of molecules) ;</i> 4. <i>phospholipids move / eq ;</i> 5. <i>proteins (in membranes) are {denatured / disrupted} ;</i> 6. <i>there is more {denaturation / disruption} at high temperatures ;</i>	mp5-NOT enzymes IGNORE -damaged	(4)

Question Number	Answer	Additional Guidance	Mark
7(a)(i)	pulmonary vein ;		(1)

Question Number	Answer	Additional Guidance	Mark
7(a)(ii)	<ol style="list-style-type: none">1. arrow drawn on the left hand side of the diagram and in the right direction ;2. arrow going from ventricle through / into the pulmonary artery ;	Do not accept if arrows drawn on both sides	(2)

Question Number	Answer	Additional Guidance	Mark
7(a)(iii)	<ol style="list-style-type: none">1. (normally) oxygenated and deoxygenated blood is separated ;2. as a result of the condition deoxygenated and oxygenated blood is {mixed / not separated / eq} ;3. (so) more oxygen flows to lungs /eq ;4. results in a {less steep / eq} oxygen concentration gradient in the alveoli ;5. less diffusion of oxygen from alveoli to (blood) capillaries ;6. less oxygen to {body/ cells/tissues/eq} ;	MP4 IGNORE lungs IGNORE concentration gradient is not maintained	(4)

Question Number	Answer	Additional Guidance	Mark
7(b)(i)	<ol style="list-style-type: none"> 1. credit length of atrial systole / complete cardiac cycle / time for complete cardiac cycle ; 2. time shown as 0.1 seconds ; 	<p>ACCEPT 5 mm / 35 mm / 0.8 seconds</p> <p>mp2-ACCEPT to any no of dps Correct answer with no working shown gains 2 marks</p>	(2)

Question Number	Answer	Additional Guidance	Mark
7(b)(ii)	<ol style="list-style-type: none"> 1. ventricular and atrial {diastole / relaxation} occurs ; 2. the semilunar valves are closed and the atrioventricular valves open ; 3. blood enters atria / atria fill with blood ; 4. atrial {systole / contraction} then occurs ; 	<p>MP2 accept AV valve / tricuspid / bicuspid</p> <p>mp3-IGNORE ventricles fill</p>	(3)

Question Number	Answer	Additional Guidance	Mark
8(a)	<ol style="list-style-type: none"><li data-bbox="434 323 1048 355">1. a change in base {sequence / eq} of DNA ;<li data-bbox="434 483 1122 515">2. coding for a particular {polypeptide / protein} ;	MP1 ACCEPT codon / nucleotide if in correct context MP1 ACCEPT a named example of a base change in DNA, e.g. 'substitution of a base in DNA'	(2)

Question Number	Answer	Additional Guidance	Mark
*8(b)(i)	<ol style="list-style-type: none"> 1. (prothrombin) has a different{ primary structure / sequence of amino acids} ; 2. change in {folding / 3D / shape /tertiary structure} (of prothrombin) ; 3. change in the {type / position} of bond {between R groups} (in prothrombin) ; 4. idea that this may affect the solubility (of prothrombin) ; 5. prothrombin may not be able to bind with thromboplastin / eq ; 6. {no / less} conversion of prothrombin to thrombin/eq ; 7. {no / less} conversion of fibrinogen to fibrin/eq ; 8. {no / less} clot formation / eq ; 	<p>QWC emphasis clarity of expression</p> <p>mp3 accept named bond eg H / disulfide / ionic Do not accept peptide bond</p>	(6)

Question Number	Answer	Additional Guidance	Mark
8(b)(ii)	<ol style="list-style-type: none"><li data-bbox="434 400 1267 475">1. the amino acid does not affect the folding / 3D structure / tertiary structure / shape } ;<li data-bbox="434 520 1021 560">2. change has no effect on the active site ;		(2)

