

Question Number	Answer	Additional Guidance	Mark
<b>1(a)(i)</b>	<ol style="list-style-type: none"> <li>idea of it being frequently inherited in the family e.g. 1, 7 and 10 all have affected offspring, 9 of the family have the disorder ;</li> <li>individual { 1 / 3 / 7 / 10 } must be heterozygous / eq ;</li> <li>use of the pedigree diagram to explain mark point 2 ;</li> <li>appropriate use recessive allele argument e.g. if it were recessive then 2 would have to be {heterozygous / a carrier} ;</li> <li>idea that it is unlikely that the unrelated parents { 8 / 11 } would also be carriers of the affected allele ;</li> </ol>	<p><b>IGNORE</b> 50% are affected</p> <p><b>1 ACCEPT</b> 8 of 14 descendants of 1 and 2</p> <p><b>2 ACCEPT</b> have one dominant allele</p>	<b>(3)</b>

Question Number	Answer	Additional Guidance	Mark
<b>1(a)(ii)</b>	<ol style="list-style-type: none"> <li>parents gametes displayed correctly ( e.g. M, m and m ,m) ;</li> <li>correct genotypes of offspring shown ;</li> <li>probability matches genotypes shown e.g. 0.5 / ½ / 1 in 2 / 50% ;</li> </ol>	<p><b>1. ACC T</b> gametes shown on a punnett square alone</p> <p><b>3. ACCEPT</b> other probabilities if match genotypes shown</p>	<b>(3)</b>

Question Number	Answer	Additional Guidance	Mark
<b>1(b)</b>	<p>Any two pairs from:</p> <ol style="list-style-type: none"> <li>idea that there is a { thick wall / thick layers / thick tunica media / eq } ;</li> <li>idea that it needs to { avoid rupture / withstand high pressure / allow expansion / eq } ;</li> <li>collagen / elastic fibres ;</li> <li>allow expansion / elastic recoil ;</li> <li>muscle { layer / fibres / wall / eq } ;</li> <li>control the flow of blood / maintain blood pressure / eq ;</li> <li>smooth endothelial wall / eq ;</li> <li>to reduce { friction / resistance / eq } ;</li> <li>narrow lumen ;</li> <li>(to maintain) high blood pressure / eq ;</li> </ol>	<p><b>3 and 4 . ACCEPT</b> folded {endothelium / (inner) surface} allows expansion</p>	<b>(4)</b>

Question Number	Answer	Additional Guidance	Mark
<b>2(a) QWC</b>	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence)  1. <i>alveoli</i> one cell thick / thin ( <i>epithelium</i> ) ;  2. { walls / <i>endothelium</i> } of <i>capillaries</i> { one cell thick / thin } ;  3. <i>Alveoli</i> covered with <i>capillaries</i> / eq ;  4. idea of short ( <i>diffusion</i> ) distance ;  5. reference to <i>diffusion</i> ;  6. idea of large surface area provided by { <i>alveoli</i> / <i>capillaries</i> } ;  7. idea that <i>concentration gradient</i> maintained by { <i>ventilation</i> / breathing / eq } ;  8 ref. to large numbers of red blood cells OR idea that <i>oxygen</i> combines with <i>haemoglobin</i> ;  9. idea that <i>concentration gradient</i> maintained by blood flow ;  10. { reference to / description of } <i>Fick's Law</i> ;	QWC emphasis is spelling Penalise once only  2. IGNORE <i>capillaries</i> are one cell thick NOT one cell thick membrane, cell wall  4. ward Mps 4 and 5 if diffusion stated  6. IGNORE 'many alveoli'  10. Diffusion rate is proportional to the surface area	(5) p

Question Number	Answer	Additional Guidance	Mark
<b>2(b) (i)</b>	1. Idea that blood carries { oxygen / carbon dioxide } ;  2. Idea that blood moving maintains concentration gradient ;  3. Reference to mass flow ;  4. Idea that organs have large surface area to volume ratio ;	1. CEPT oxygenated blood  3. IGNOR mass transport  4. IGNORE <i>Daphnia</i> has a large surface area	(2) Exp

Question Number	Answer	Additional Guidance	Mark
<b>2 (b) (ii)</b>	1. idea that one side (of heart) transports blood to the lungs other to the body ;  2. separation of oxygenated and deoxygenated blood / eq ;  3. idea of maintaining concentration gradient ;  4. comment on blood pressures e.g. lower to lungs, higher to body ;  5. Reference to mass flow / supply of O <sub>2</sub> to body cells maximised ;  6. idea of need for a good supply of oxygen as (mammals are) { very active / high rate of metabolism / warm blooded / eq } ;	5. IGNOR mass transport	(3) p

Question Number	Answer	Additional guidance	Mark
<b>3(a)</b>	Idea that (a change in) one variable (directly) results in the change of another variable ;	ALLOW causes, affects, etc and clear examples Eg increase in blood cholesterol causes an increase in the risk of CVD  IGNORE correlation, link, relationship, trend, etc alone	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
<b>3(b)(i)</b>	<ol style="list-style-type: none"> <li>1. reference to peptide bonds (joining amino acids);</li> <li>2. between amino group (of one amino acid) and carboxyl group (of another) / eq ;</li> <li>3. the sequence of amino acids is the primary structure of the protein / eq ;</li> <li>4. reference to folding (of primary structure) held together by bonds / eq ;</li> <li>5. { disulfide bridges / eq } / { hydrogen / H } bond / ionic bonds / Van der Waals forces ;</li> <li>6. between the R groups / eq ;</li> </ol>	<ol style="list-style-type: none"> <li>2. AL W from a labelled diagram ALLOW NH<sub>2</sub> and COOH</li> <li>4. AL W ref to alpha helix or beta pleated sheet</li> </ol>	<b>(4)</b>

Question Number	Answer	Additional guidance	Mark
<b>3 (b) (ii)</b>	<ol style="list-style-type: none"> <li>1. HDL is smaller ;</li> <li>2. HDL contains more protein / eq ;</li> <li>3. HDL contains less cholesterol / eq ;</li> </ol>	<b>ALLOW</b> converse for LDL	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
<b>3(c) (i)</b>	<ol style="list-style-type: none"> <li>1. (risk due to) high blood pressure has fallen overall / eq ;</li> <li>2. (risk due to) high blood cholesterol has fallen overall / eq ;</li> <li>3. (risk due to) obesity has risen overall / eq ;</li> <li>4. obesity was the lowest risk factor but is now the highest / eq ;</li> <li>5. credit use of manipulated figures ;</li> </ol>	<p>Answers should cover total time period and not just 1980-1990</p> <p>5. o y credit overall change figures e.g.  17% drop for high blood pressure  16% drop for high blood cholesterol  10.5% increase in obesity</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
<b>3(c)(ii)</b>	1. people more aware of the risks / eq ; 2. people consuming foods with lower {cholesterol levels / saturated fats / eq} / eq ; 3. people consuming foods with more fibre in them / eq ; 4. use of statins / eq ; 5. more screening / eq ; 6. more exercise / eq ;	1. ALLOW more aware of healthy diets      4. Use of sterols/named example  5. ALLOW self testing	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
<b>3(c)(iii)</b>	Any <b>two</b> from: (being) male increase in age lack of exercise / inactivity smoking genetics high alcohol consumption high salt diet high saturated fat intake stress diabetes ;	IGNORE fat, LDL or cholesterol consumption	<b>(1)</b>

