

Question Number	Answer	Mark
<b>1(a)(i)</b>	<p><b>The only correct answer is A – a glycosidic bond</b></p> <p><b>B</b> is not correct because they do not form hydrogen bonds</p> <p><b>C</b> is not correct because fats form ester bonds</p> <p><b>D</b> is not correct because they do not contain ionic bonds</p>	<b>(1)</b>

Question Number	Answer	Mark
<b>1(a)(ii)</b>	<p><b>The only correct answer is C - hydrolysis</b></p> <p><b>A</b> is not correct because this occurs when glycogen is formed</p> <p><b>B</b> is not correct because this occurs when fats are formed</p> <p><b>D</b> is not correct because this refers to DNA</p>	<b>(1)</b>

Question Number	Answer	Additional Guidance	Mark
<b>1(b)(i)</b>	<ol style="list-style-type: none"> <li>correctly formed peptide bond ;</li> <li>rest of dipeptide drawn correctly ;</li> <li>molecule of water shown ;</li> </ol>	<p>MP1 I-CONH/CO-NH/COHN I-orientation</p> <p>MP2 A-COOH/NH<sub>2</sub></p> <p>MP3 A-chemical or structural formula</p>	<b>(3)</b>

Question Number	Answer	Additional Guidance	Mark
<b>1(b)(ii)</b>	polypeptide / protein ;	ACCEPT dipeptide/peptide DNA-peptide bond	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
<b>1(c)</b>	<ol style="list-style-type: none"> <li>1. water is a <b>solvent</b> ;</li> <li>2. water is {slightly charged / dipole / polar / eq} ;</li> <li>3. idea that {polar molecules / charged molecules / ions} dissolve/eq in water ;</li> <li>4. correctly <b>named</b> example of a solute transported ;</li> </ol>	<p>"water is a polar solvent"=mp1/2</p> <ol style="list-style-type: none"> <li>2. A- <b>correct</b> reference to hydrogen bonds A-ref to H slightly +ve and O slightly -ve I-amphoteric / charged / ion</li> <li>3. A-ref to being soluble A-substances as eq A-ionic compounds</li> <li>4. Eg O<sub>2</sub>/CO<sub>2</sub>/glucose/amino acids/sodium ion/proteins</li> </ol>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
2(a)	<p>1. it affects the blood vessels <b>and</b> the heart / eq ;</p> <p>2. correct description of an effect/named effect ;</p>	<p>1. A-named / type of vessel I-CV/circulatory system</p> <p>2. A-narrowed or blocked blood vessel / atherosclerosis / plaques / atheroma / reduced blood or O2 supply</p> <p>"A blockage of the coronary artery"=mp1 &amp; 2</p> <p>I-named CVDs / CHDs(these are consequences not effects)</p>	<b>(2)</b>

Question Number	Answer	Mark
2(b)	<p><b>The only correct answer is B - antihypertensives</b></p> <p><i>A is not correct because anticoagulants prevent blood clotting</i></p> <p><i>B is not correct because platelet inhibitors act on platelets</i></p> <p><i>D is not correct because statins reduce cholesterol levels</i></p>	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
2(c)	<p><b>Any two from:</b></p> <p>genetics / diet* / age / gender / smoking / exercise / alcohol / stress /obesity/inactivity/high cholesterol/eq ;</p>	<p>I-lifestyle only  I-high blood pressure  *A-eg high fat / salt /sugar intake  A-high BMI/overweight</p>	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
2(d)(i)	1. idea that the populations of the countries are different ; OR 2. idea that it allows for standardisation or comparison ;	I-ref to sample size/reliability/accuracy	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
2(d)(ii)	1. $141 - 115 = 26$ ;  2. 18.44 (%) ;	Correct answer no working gains 2 marks No ecf  A-18/18.4/18.439 DNA-18.43	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
2(d)(iii)	<p>1. idea of improvements in education (health related);</p> <p>2. idea of improvements in healthcare;</p> <p>3. idea of improvements in lifestyle;</p>	<p>1. A- increased public awareness/knowledge/literacy</p> <p>2. A-preventative measures e.g. screening, diagnosis, medication, treatment/named treatment eg statins</p> <p>3. A- examples of lifestyle changes eg more exercise/improved diet/stop smoking</p> <p>All 3 mps should imply an improvement eg ref to more/better/eq</p> <p>I-ref to changes only</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
3(a)(i)	1. {alteration / change / eq} in DNA ;  2. a change in {base / codon / nucleotide} sequence / a named type of mutation ;	MP1 and 2 ACCEPT "a change in the base sequence of DNA" for 2 marks  2. A- (base) substitution, insertion, deletion	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
3(a)(ii)	1. it is always expressed / always shown in the phenotype ;  2. an allele is {form / version / alternative / variant} of a gene ;	1. A- only one dominant allele is needed I-present only  Mp2 DNA-a type of gene	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
<b>3(b)(i)</b>	1. genotypes of parents shown correctly ;  2. correct gametes shown ;  3. all four correct genotypes for all offspring ;  4. phenotypes correctly matched to genotypes of offspring ;	ecf from mp1 A-any letter/penalize use of 2 diff letters once  MP2 and 3 ACCEPT in Punnett square  4.A- normal / healthy / sufferer / affected/eq If pedigree diagram drawn-0 marks unless genotypes stated then mp1, 3 and 4	<b>(4)</b>

Question Number	Answer	Mark
<b>3(b)(ii)</b>	0.5 / 50% / ½ / 1 in 2 / 2 in 4 / 1:1;	ecf from 3bi mp4 DNA-2:4 <b>(1)</b>



Question Number	Answer	Mark
4(a)	<p><b>The only correct answer is C - contain phosphate groups</b></p> <p><i>A is not correct because only RNA is single stranded</i></p> <p><i>B is not correct because only DNA contains deoxyribose</i></p> <p><i>D is not correct because only RNA contains uracil</i></p>	(1)

Question Number	Answer	Additional guidance	Mark										
4(b)(i)	<p>Sequence:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>A</td><td>C</td><td>T</td><td>T</td><td>C</td><td>G</td><td>C</td><td>C</td><td>G</td><td>A</td> </tr> </table> <p>1. both adenines correct;</p> <p>2. rest of sequence correct;</p>	A	C	T	T	C	G	C	C	G	A		(2)
A	C	T	T	C	G	C	C	G	A				

Question Number	Answer	Mark
4(b)(ii)	<p><b>The only correct answer is B - 300</b></p> <p><i>A is not correct because it is a triplet code so 100 is too few</i></p> <p><i>C is not correct because it is a triplet code so 600 is too many</i></p> <p><i>D is not correct because it is a triplet code so 900 is too many</i></p>	(1)

Question Number	Answer	Additional guidance	Mark
*4(c)	<ol style="list-style-type: none"> <li>1. transcription named as stage ;</li> <li>2. DNA {separates / unwinds / unzips / uncoils/ eq} ;</li> <li>3. by breaking hydrogen bonds ;</li> <li>4. (mono) nucleotides line up with complementary bases / complementary base pairing occurs ;</li> <li>5. phosphodiester bonds form (between mononucleotides) ;</li> <li>6. ref to any correctly named enzyme ;</li> <li>7. messenger RNA / mRNA {detaches / leaves the nucleus / enters cytoplasm} ;</li> </ol>	<p><b>QWC-emphasis is on logical sequence.</b></p> <ol style="list-style-type: none"> <li>1. A-DNA is transcribed</li> <li>4. A-RNA nucleotides not-DNA nucleotides A-named bases / letters e.g. A-U / T-A / G-C</li> <li>6. A-( RNA ) polymerase / helicase not-DNA polymerase</li> </ol> <p>**If candidate talks about transcription AND translation then max marks available(read whole response) If they incorrectly name the stage as translation but then describe transcription they lose mp1 only</p>	<b>(5)</b>

Question Number	Answer	Additional guidance	Mark
<b>5(a)</b>	1. $x=30 \times \{ 3.8025 / 3.8/ 1.95^2 \}$ ; 2. 114.075 / 114 / 114.1 / 114.08 (kg) ;	Correct answer without working gains 2 marks No ecf	<b>(2)</b>

<b>Question Number</b>	<b>Answer</b>	<b>Additional guidance</b>	<b>Mark</b>
<b>5(b)(i)</b>	<ul style="list-style-type: none"> <li>1. idea that as BMI increases % diabetes increases (overall);</li> <li>2. a decrease between 20-24 ;</li> <li>3. credit correct manipulation of figures linked to mp1 / 2 ;</li> </ul>	<ul style="list-style-type: none"> <li>1.A-positive correlation I-ref to womens data</li> <li>3. eg.58% less in 35-39 cf 40+/2% less n 20-24 cf less than 20/overall increase of 94%</li> </ul>	<b>(2)</b>

<b>Question Number</b>	<b>Answer</b>	<b>Additional guidance</b>	<b>Mark</b>
<b>5(b)(ii)</b>	<ul style="list-style-type: none"> <li>1. incidence higher in men (in all categories) ;</li> <li>2. <math>\geq 40</math> there is the greatest difference / 20-24 has the smallest difference ;</li> <li>3. credit correct manipulation of data linked ;</li> </ul>	<ul style="list-style-type: none"> <li>1. A- converse</li> <li>2. A-67% greatest / 3% smallest</li> </ul>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
5(c)	<p>1. take exercise ;</p> <p>2. reduce {energy intake / calorie or kJ intake / eq} ;</p>	<p>1. A- named exercise/sport</p> <p>2. A-correct ref to energy budgets eg energy output exceeding energy input</p> <p>I-ref to diet / dietary components/named foods only eg a low fat / sugar diet</p> <p>3.</p>	<b>(2)</b>

Question Number	Answer	Additional guidance	Mark
5(d)	<ol style="list-style-type: none"> <li>1. idea of {under / overestimation/ eq} of food intake ;</li> <li>2. idea of lack of education about {nutrition / diet / eq} ;</li> <li>3. idea that they may be {untruthful / forgetful / eq } ;</li> </ol>	<ol style="list-style-type: none"> <li>1.A-portions incorrectly weighed/calculated</li> <li>2. A-lack of awareness/knowledge</li> <li>3 A-lie/biased</li> </ol> <p>I-ref to other variables not being controlled</p>	<b>(2)</b>

Question Number	Answer	Mark
6(a)(i)	<p><b>The only correct answer is B - catalyse the conversion of fibrinogen to fibrin</b></p> <p><i>A is not correct because its only role is to convert fibrinogen to fibrin</i></p> <p><i>C is not correct because its only role is to convert fibrinogen to fibrin</i></p> <p><i>D is not correct because its only role is to convert fibrinogen to fibrin</i></p>	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
6(a)(ii)	<p>1. the {coronary artery/eq} becomes {blocked/narrowed/eq};</p> <p>2. blood flow to the heart is reduced/eq ;</p> <p>3.(this) prevents {oxygen/glucose} from reaching the heart {cells / muscle / tissue};</p> <p>4. (cardiac) muscle is {unable to contract / respire /eq} ;</p>	<p>1. <b>ACCEPT</b>-artery carrying blood to the heart</p> <p>"oxygenated blood cannot reach heart cells"=mp2/3</p> <p>4. <b>ACCEPT</b> no or less ATP made/heart cells die</p> <p>I-refs to anaerobic respiration/lactic acid</p> <p>I-heart fatigues/stops working</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
<b>6(b)</b>	1. 8.0mm ;  2. 0.67 ;	1. measurement within range of 7.0mm to 9.0mm ; A correct answer in cm;  2. answer within range of 0.58 to 0.75 ;	<b>(2)</b>



Question Number	Answer	Additional guidance	Mark
*6(c)	<ol style="list-style-type: none"> <li>1. artery walls {are thick / contain collagen } ;</li> <li>2. to withstand high pressure / eq ;</li> <li>3. arteries contain elastic fibres ;</li> <li>4. help to maintain pressure / allow stretch and recoil ;</li> <li>5. arteries have smooth muscle ;</li> <li>6. changes the diameter of the artery / allow contraction and relaxation ;</li> <li>7. arteries have a smooth endothelium / eq ;</li> <li>8. to reduce { friction / resistance / eq } ;</li> <li>9. arteries have a folded endothelium /eq ;</li> <li>10. to allow expansion ;</li> </ol>	<p><b>QWC emphasis on clarity of expression</b></p> <p>Paired responses-1/3/5/7/9 are independent structure marks and 2/4/6/8/10 are associated function marks.</p> <p>Mp6 A-constriction and dilation</p> <p>Mp7 and 9 A-inner lining</p>	<p><b>(5)</b></p>

Question Number	Answer	Additional guidance	Mark
<b>(7)(a)</b>	<ol style="list-style-type: none"> <li>1. idea that the mutation changes the {primary structure / sequence of amino acids} in the (CFTR) protein ;</li> <li>2. idea that this leads to a {non-functional / faulty / absent / eq} (CFTR) protein/ (chloride) channel ;</li> <li>3. chloride ions {do not move out of / move into} the cell ;</li> <li>4. water {does not move out of / moves into} the cell ;</li> </ol>	<p>Mp3 I-ref to sodium ions A-chlorine ion DNA-chlorine only</p> <p>Mp3 &amp; 4 A-stay in the cell</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
7(b)(i)	1. amniocentesis ; 2. amniotic fluid collected ; 3. between 14 and 20 weeks of pregnancy ; 4. {DNA/genes} analysed / cells cultured ; <p style="text-align: center;"><b>Or</b></p> 5. chorionic villus sampling / CVS ; 6. sample taken from placenta ; 7. between 8 and 12 weeks of pregnancy ; {DNA/genes/alleles} analysed / cells cultured ;	If method does not match description do not award first mark.  Mp3 & 7-accept any figure within the given range  Mp4 & 8-accept DNA is tested  Mp5 accept testing	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
7(b)(ii)	1. idea that the condition is rare / no family history / eq ; <p style="text-align: center;">OR</p> 2. idea that the test is {expensive / unavailable / eq } ;	Mp1 A-parents not carriers  I-refs to risks/ethics or religion	<b>(1)</b>

Question Number	Answer	Additional guidance	Mark
7(b)(iii)	1. idea that it may result in a miscarriage / spontaneous abortion ; 2. idea of risk of false {positive / negative} / inaccurate result ; 3. comment on consequence e.g. healthy fetus may be aborted ; 4. {killing / eq} is {wrong / unethical / eq} ; 5. who has right to decide if tests should be performed / eq ;	Mp1 A-harms/damages fetus/embryo  I-ref baby  Mp4 A-fetus has a right to life/eq	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
<b>8(a)</b>	<p>1. activity increases up to {40 °C / optimum temperature} <b>and</b> decreases above {40 °C / optimum temperature} ;</p> <p>2. the increase is non-linear / exponential / eq ;</p> <p>3. credit correct manipulation of data linked to mp1 or 2 ;</p>	<p>Mp1 &amp; 2 A-peak</p> <p>Mp1 I-refs to rate of decrease in mass</p> <p>Mp2 A-increases at an increasing rate</p> <p>Mp3-eg from 10-40/up to 40 there is a 312.5% or 25mg/min increase</p> <p>Mp3-eg above 40/from 40-50 there is a 69.7/70% or 23mg/min decrease</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
8(b)	<p>1. ref to the enzyme is { denatured / denaturing } ;</p> <p>2. because {R-groups are vibrating / bonds are breaking / eq} ;</p> <p>3. therefore { no starch / less starch } binds to the active site / { no / fewer } ESCs formed ;</p> <p>4. therefore the { glycosidic bond / starch} is not { hydrolysed / broken down } ;</p>	<p>2.DNA-peptide bond</p> <p>2.A-other named bonds</p> <p>3.A-substrate as eq to starch and fits into as eq to binds</p> <p>4. A less broken down if in context with mp3</p>	<b>(3)</b>

Question Number	Answer	Additional guidance	Mark
8(c)	<ol style="list-style-type: none"> <li>1. idea of determining the mass of {starch / peas / seeds } at start and end ;</li> <li>2. allow {peas / seeds} to { germinate / grow / eq } ;</li> <li>3. controlled variable in { peas /seeds } ;</li> <li>4. description of how rate is calculated ;</li> <li>5. temperature controlled in a water bath / eq ;</li> <li>6. repeat and calculate of a mean / average ;</li> </ol>	<p>Mp1 I-amount of peas</p> <p>Mp3 A-eg age/species/type</p> <p>I-size/volume/mass</p> <p>Mp4 A-correct equation/calculation</p> <p>Mp5 A-incubator/temp controlled room</p> <p>If wrong experiment described 2 marks max-mp 5/6</p>	<b>(4)</b>

Pearson Education Limited. Registered company number 872828  
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom