

1)

<p>a)</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">contracted</td> <td style="padding: 5px;">relaxed</td> </tr> <tr> <td style="padding: 5px;">relaxed</td> <td style="padding: 5px;">contracted</td> </tr> <tr> <td style="padding: 5px;">relaxed</td> <td style="padding: 5px;">relaxed</td> </tr> </table> <p style="text-align: center;">1 mark for any two correct boxes ;;;</p>	contracted	relaxed	relaxed	contracted	relaxed	relaxed	<p>(3)</p>
contracted	relaxed							
relaxed	contracted							
relaxed	relaxed							
<p>b)</p>	<ol style="list-style-type: none"> 1. valves {separate / eq} atria from ventricles ; 2. open during atrial {systole / contraction } / eq ; 3. so that blood can pass through to ventricles / eq ; 4. closed during ventricular {systole / contraction} eq ; 5. to prevent {blood being forced back / backflow / eq} (up into atria) / to maintain pressure in ventricles ; 6. open during diastole / eq ; 7. so that ventricles can start to fill up (as atria are filling) ; 	<p>max (4)</p>						
<p>(c)(i)</p>	<ol style="list-style-type: none"> 1. (time for complete cardiac cycle) = 0.96 to 0.98 (sec) ; 2. $60 \div$ cycle time ; 3. correct answer {beats per minute / bpm} ; 	<p>(3)</p>						
<p>(c)(ii)</p>	<ol style="list-style-type: none"> 1. correct reference to <u>pressure</u> differences e.g. left is higher ; 2. left ventricle pumps blood {all around body / to rest of body / many arteries / systemic} / eq ; 3. right ventricle pumps blood to {lungs / pulmonary system / eq} ; 4. idea that if blood under high pressure there would be {damage / eq} to {lungs / capillaries / eq} ; 5. reference to lots of muscle (contracting in left ventricle) / reference to thick wall (of left ventricle) ; 	<p>max (3)</p>						

2)

(a)	<p><u>Causation:</u> when a change in one variable is responsible for a change in another variable / eq ;</p> <p><u>Correlation:</u> (relationship between two variables such that) a change in one of the variables is reflected by a change in the other variable / eq ;</p>	(2)
(b)(i)	<ol style="list-style-type: none"> 1. {no relationship / little difference} between ethnic group and cholesterol level / eq ; 2. {more / higher percentage of} black and African Americans have {highest / higher} blood pressure than both White and Mexican Americans / eq ; 	(2)
(b)(ii)	not enough people surveyed / eq ;	(1)
c)	<ol style="list-style-type: none"> 1. idea that {other variables present / other variables need considering / no information available about other variables} (for a causal relationship) ; 2. named variable (e.g. genetics, ethnic group, mass of individuals, age of individuals, diet, smoking, exercise) ; 3. idea that cholesterol level of 204 mg dm^{-3} may not be significantly lower than 207 mg dm^{-3} ; 4. idea that {30% may not be significantly different from 26% / two values are not very different} ; 5. no information on how many tested / survey not repeated elsewhere ; 	max (3)

<p>3) (a)</p>	<ol style="list-style-type: none"> 1. both decrease ; 2. mortality rate in men is higher than that in women (throughout time period) / eq ; 3. this difference is greater at the start of the time period than at the end / eq ; 4. a valid comparison made about the difference in the changes e.g. between 1997 and 1998 the rate stays constant for males but falls for women / fall in mortality rate in men is steeper than the fall in women / decrease in mortality rate is greater in men than women / the decrease in men is less uniform than in women ; 5. correct manipulation of figures to quantify any of the above ; 	<p>max (3)</p>
<p>(b)</p>	<ol style="list-style-type: none"> 1. {people more aware of the dangers / better health education} / appropriate named example /eq ; 2. less stress /eq ; 3. {better / more} screening / eq ; 4. better treatments / eq ; 5. more exercise being taken / eq ; 6. changed diet / less obesity / eq ; 7. less alcohol intake / eq ; 8. decrease in smoking ; 9. change in population genetics / eq ; 	<p>max (3)</p>
<p>(c)</p>	<ol style="list-style-type: none"> 1. damage to {endothelial cells / epithelial cells / cells lining artery (wall)} ; 2. reference to inflammatory response ; 3. reference to (accumulation of) white blood cells in (damaged area) ; 4. {build up / eq} of cholesterol (in damaged area) ; 5. reference to build up of {calcium salts / fibrous tissue / fibrin / platelets} ; 6. reference to formation of {atheroma / plaque} ; 7. reference to {loss of elasticity (of artery) / narrowing of lumen} / eq ; 8. idea that this process is self-perpetuating ; 	<p>max (4)</p>

4)

(a)	<ol style="list-style-type: none"> 1. vitamin C content decreases during first {145 / 150} days of storage / eq ; 2. no further decrease in vitamin C content (after first {145 / 150} days) / eq ; 3. idea that decrease is {fastest / greatest} up to 25 days ; 4. rate of decrease decreases with time / eq ; 5. correct manipulation of figures ; 	max (3)
(b)	<ol style="list-style-type: none"> 1. reference to DCPIP ; 2. reference to use of (camu-camu) juice ; 3. idea of titrating juice with DCPIP ; 4. correct reference to colour change e.g. from blue to {colourless / pink} ; 5. use of calibration curve to determine vitamin C concentration / comparison with standard vitamin C ; 6. reference to procedure being repeated at (regular) time intervals e.g. everyday ; 7. reference to replication ; 8. description of one controlled variable ; 9. reference to drawing graph of both sets of results ; 	max (5)

5)

(a)	<ol style="list-style-type: none"> 1. {movement / diffusion / eq} of water through a partially permeable membrane / eq ; 2. from a region with more free water to a region with less free water / down water concentration gradient / eq ; 	(2)
(b)(i)	<ol style="list-style-type: none"> 1. due to high uptake of more water / eq ; 2. as higher water concentration outside potato / eq ; 3. idea of largest difference in concentrations of solutions ; 	(3)
(b)(ii)	<p>EITHER</p> <ol style="list-style-type: none"> 1. {mass increased / positive change} at 0.6 and {mass decreased / negative change} at 0.8 (mol dm^{-3}) ; 2. idea that concentration is closer to 0.8 than 0.6 mol dm^{-3} as the decrease in mass is greater than the increase in mass - 0.11 is closer to zero than + 0.31 ; 3. idea of no net movement of water ; <p>OR</p> <ol style="list-style-type: none"> 1. results were plotted onto a graph ; 2. the line crossed the x axis at 0.75 mol dm^{-3} eq ; 3. idea of no net movement of water ; 	max (2)
(c)	<p>Any two from: age, {type / variety / genotypes / country of origin / eq}, storage time, growth conditions, part of potato used, damage, sprouting, {storage conditions / temperature / humidity / light / eq} ; ;</p>	(2)
(d)	<p>Any two from: potato pieces are not straight, potato widths are different, edges may not be cut straight, rulers are {subjective / analogues}, change in length is small, only measuring changes in one plane ; ;</p>	(2)

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6)																			
a)	idea of found in only one specific geographical location ;	ACCEPT reference to {one / the} area / place IGNORE habitat or environment	(1)																
b)	<ol style="list-style-type: none"> idea that genetic diversity {will be low / decreases / stays the same } OR idea of smaller gene pool ; closely related wolves mating / inbreeding / eq ; risk of inbreeding depression / more chance of homozygous recessive genotypes / eq ; risk of genetic drift / eq ; 	<ol style="list-style-type: none"> NOT interbreeding Do not give this mark for "inbreeding depression" ACCEPT greater risk of genetic disorders ACCEPT reference to loss of alleles 	(2)																
c)	<ol style="list-style-type: none"> idea that this increases the gene pool ; idea that this increases potential for the species to { adapt / survive } ; description of how this will increase survival e.g. better hunters, disease resistance ; 	<ol style="list-style-type: none"> ACCEPT introduction of genetically different individuals, { new / different } alleles introduced into population ACCEPT population but not individuals 	(2)																
d)(i)	<table border="1"> <thead> <tr> <th>Adaptation for the Ethiopian wolf</th> <th>Behavioural</th> <th>Anatomical</th> <th>Physiological</th> </tr> </thead> <tbody> <tr> <td>Small sharp teeth widely spaced to cope with small prey</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>Narrow snout to fit into small gaps when hunting small prey</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>Hunting alone, as prey too small to share with other wolves</td> <td>X</td> <td></td> <td></td> </tr> </tbody> </table>	Adaptation for the Ethiopian wolf	Behavioural	Anatomical	Physiological	Small sharp teeth widely spaced to cope with small prey		X		Narrow snout to fit into small gaps when hunting small prey		X		Hunting alone, as prey too small to share with other wolves	X			ACCEPT in the cells indicated a cross or tick	(3)
Adaptation for the Ethiopian wolf	Behavioural	Anatomical	Physiological																
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d)(ii)	<p>(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence)</p> <ol style="list-style-type: none"> genetic variation in population / variation due to mutation / eq ; description of selection pressure ; idea that some individuals possessed { advantageous / beneficial / eq } characteristics ; (therefore) survived to adulthood / survived to breed ; passing on {advantageous alleles / eq} (to offspring) / eq ; change in allele frequency (over generations) / eq ; idea of {geographical / reproductive} isolation ; 	<p>QWC emphasis is clarity of expression</p> <ol style="list-style-type: none"> ACCEPT small prey NOT just passing on a characteristic or genes 	(4)																

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7)

(a (i))	D ;	(1)
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Question number	Answer	Mark
(a (ii))	B ;	(1)

Question number	Answer	Mark
(a)(iii)	B ;	(1)

Question number	Answer	Mark
(a)(iv)	A ;	(1)

(b)(i)	<p>1. (total) cholesterol levels in people with mutation are not higher than people without mutation / eq ;</p> <p>2. LDL (cholesterol) levels in people with mutation are not higher than people without mutation / eq ;</p> <p>3. HDL (cholesterol) levels in people with mutation are not lower than people without mutation / eq ;</p> <p>4. credit correct use of manipulated figures ;</p>	<p>1, 2, 3: ACCEPT converse, similar / little difference. Decreased/reduced is not equivalent to lower.</p> <p>1. IGNORE same</p> <p>2. IGNORE same</p> <p>3. ACCEPT ref to HDL to LDL ratio higher in people with the mutation.</p> <p>4. must be manipulated e.g. difference calculated and not just quoted (difference in LDL= 10, total cholesterol= 7) ACCEPT without units</p>	(2)
(b)(ii)	(plant) statin ;	IGNORE named drug, sterol, statin	(1)

(b)(iii)	<p>1. muscle {inflammation / pain / eq}</p> <p>2. liver {damage / failure / eq}</p> <p>3. joint {aches / pains / eq}</p> <p>4. nausea/ constipation / diarrhoea / indigestion / flatulence / loss of appetite / eq</p> <p>5. kidney {damage / failure / eq}</p> <p>6. cataracts / blurred vision</p> <p>7. diabetes</p> <p>8. allergies / skin inflammation / skin rash / eq</p> <p>9. respiratory problems / persistent cough / nosebleeds / eq</p> <p>10. headaches / dizziness / depression / insomnia / ringing in ears / fatigue / eq ;</p>	<p>NOT cancer or reduced vitamin absorption IGNORE affect</p> <p>ACCEPT problems as equivalent to damage etc</p> <p>2. ACCEPT disease</p> <p>4. ACCEPT vomiting</p> <p>5. ACCEPT kidney disease</p> <p>10. ACCEPT mood swings</p>	(1)
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