

1)

a)(i)	<p>Any three from:</p> <ol style="list-style-type: none"> 1. decrease in smoking / not smoking / eq ; 2. reference to {increase / regular / eq} exercise ; 3. improvements to diet qualified, e.g. reduce salt, reduce saturated fat, increase fibre ; 4. maintaining appropriate weight / eq ; 5. {moderate / reduced} alcohol consumption / eq ; 6. reducing stress / eq ; 7. use of medication e.g. statins, antihypertensives, warfarin ; 	(3)
a)(ii)	<ol style="list-style-type: none"> 1. (less) cholesterol (in blood) to build up on artery (wall) / eq ; 2. less likely to develop atherosclerosis / eq ; 3. credit correct reference to subsequent consequence of atherosclerosis e.g. narrowing of arteries, ischaemia, decrease in flow of blood (to heart) ; 	(2)
b)	<ol style="list-style-type: none"> 1. age effect qualified e.g. older increases risk, {arteries {become less elastic / more easily damaged / blood pressure increases} with (increase in) age ; 2. gender effect qualified e.g. {women less likely to develop CVD than men / oestrogen offers some protection to women against CVD } (pre menopause) / eq ; 	(2)
c)(i)	<ol style="list-style-type: none"> 1. Finland has the highest death rate / eq ; 2. Sweden has the lowest death rate / eq ; 3. credit correct manipulation of figures to compare one of these countries to one other country ; 	(3)

(c)(ii)	<ol style="list-style-type: none"> 1. Finland {highest on graph / not highest on map} Germany and UK have the highest on the map / eq ; 2. idea that a number (3 or more) of countries are the same on the map ; 3. France does not have the lowest number of deaths / eq ; 4. Credit any other correct comparison ; 5. {map shows number of deaths and graph shows relative death rate / map gives the results grouped together but graph shows individual values / map does not allow for population size} ; 	(2)
(c)(iii)	<p>Any one from:</p> <ol style="list-style-type: none"> 1. the data on the map is shown in groups / eq; 2. the data might come from a different year / different time / no information given on the year / eq ; 3. different groups of people were surveyed / eq ; 4. idea that bar graph shows number of deaths relative to population / the map does not take into account the population of the country ; 	(1)

2)

<p>* (a)QWC</p>	<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"> 1. (<i>gas exchange</i>) occurs through the {<i>cell membrane / phospholipid bilayer</i>} ; 2. idea that the <i>membrane</i> is thin ; 3. <i>oxygen</i> enters cell (from water) / eq ; 4. <i>carbon dioxide</i> leaves cell (into water) / eq ; 5. {<i>O₂ / oxygen / CO₂ / carbon dioxide</i>} are {<i>small / non-polar</i>} (<i>molecules</i>) ; 6. reference to <i>diffusion</i> ; 7. {reference to / description} (<i>suitable concentration gradient</i>) ; 8. reference to <i>large surface area (to volume ratio)</i> ; 	(4)
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(b)	<ol style="list-style-type: none"> 1. reference to diffusion (in the cytoplasm) ; 2. through the cytoplasm / description of part of cytoplasm / eq ; 3. down a concentration gradient (in the cytoplasm) / eq ; 	(2)
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3)

* (a) QWC	<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"> 1. {damage / eq} to {endothelial cells/ epithelial cells / lining / eq} of artery ; 2. ref to inflammatory response ; 3. ref to migration of white blood cells into area / eq ; 4. build up of cholesterol /eq ; 5. reference to formation of atheroma / plaque ; 6. reference to {calcium salts / fibrous tissue} ; 7. ref to {loss of elasticity (of artery) / narrowing of lumen} / eq ; 8. idea that this process is self-perpetuating ; 	(4)
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(b)(i)	{the alleles / eq} present (in an organism) / eq ;	(1)
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(b)(ii)	a (different) form of one gene / eq ;	(1)
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(c)	<p>Any two from: More saturated fat / more cholesterol / more salt / obesity / more alcohol / more age / male / post-menopausal women / high blood pressure / smoking / diabetes / less activity / stress ;</p>	(1)
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d)	<ol style="list-style-type: none"> 1. muscle {inflammation / pain / eq} ; 2. liver {damage / failure/ eq} ; 3. joint {aches / pains/ eq} ; 4. nausea/constipation/diarrhoea ; 5. kidney {damage / failure / eq} ; 6. cataracts ; 7. diabetes ; 8. allergies / skin inflammation / skin rash / eq ; 9. respiratory problems / persistent cough / eq ; 10.headaches / dizziness / depression ; 	(2)
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4)	<p>* (a)QW C</p> <p>Take into account quality of written communication when awarding the following points.</p> <ol style="list-style-type: none"> 1. idea that there are four chambers ; 2. correct reference to relative position of <i>atria</i> and <i>ventricles</i> ; 3. idea of left and right sides separate / <i>septum</i> ; 4. reference to muscular nature of walls ; 5. reference to <i>cardiac</i> muscle ; 6. idea of relative thickness of <i>ventricle</i> (walls) ; 7. correct reference to position of {<i>atrioventricular valves</i> / eq} ; 8. correct reference to position of <i>semilunar valves</i> ; 9. reference to position of {<i>tendons / tendinous cords / papillary muscles</i> / eq} ; 10. correct reference to position of {<i>aorta / pulmonary artery</i>} ; 11. correct reference to position of {<i>vena cava / pulmonary vein</i>} ; 12. correct reference to <i>coronary arteries</i> ; 13. reference to {<i>SAN / Sino Atrial Node / pacemaker/ AVN /Atrioventricular Node / Purkinje fibres /Purkyne fibres / Bundle of His/eq</i>} ; 	(5)
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(b)	<ol style="list-style-type: none"> 1. idea that the heart has to pump blood a long way around the body of the giraffe ; 2. (therefore) blood needs to be (pumped) at high pressure / eq; 3. blood vessels are needed to contain the blood / reference to closed circulation / eq ; 4. idea of double circulatory system ; 5. capillaries needed to ensure that all parts of giraffe are close to blood supply/ eq ; 6. idea of need for a circulation to {provide oxygen / remove carbon dioxide / other correct named substance} ; 7. idea of {oxygen / glucose} needed as {high metabolic rate / high rate of respiration / eq} ; 8. idea of diffusion not meeting the requirements of the giraffe ; 9. reference to low surface area to volume ratio ; 10. idea that circulatory system helps regulation of body temperature ; 	(4)
5) (a)	<ol style="list-style-type: none"> 1. correct measurements of wall without plaque = {8 +/- 1} (mm) ; 2. correct measurements of wall with plaque = {25 +/- 2} (mm); 3. correct calculation ; 	(3)
(b)(i)	<ol style="list-style-type: none"> 1. reference to decrease in (energy /ATP) (with time) ; 2. idea that the drop in the fall of (energy /ATP) gets less with time ; 3. credit correct manipulation of figures ; 	(2)
(b)(ii)	<ol style="list-style-type: none"> 1. idea of {less / no / eq } oxygen (available) ; 2. idea of {less / no / eq} {respiratory substrate / glucose / eq} ; 3. {less / no/ eq} (cellular/ aerobic) respiration / eq ; 	(2)

(b)(iii)	<ol style="list-style-type: none"> 1. idea that at 8 minutes insufficient {energy / ATP} is available for contraction ; 2. idea that after 20 minutes the {energy / ATP} levels are too low to sustain cell survival ; 3. credit correct value for {energy / ATP} availability read from graph e.g. 50-52 % at 8 min / 22-24% at 20 min ; 4. credit one other named use of {energy / ATP} e.g. active transport ; 5. idea that lactic acid {inhibits contraction / inhibits enzymes / eq} ; 	(3)
(b)(iv)	<ol style="list-style-type: none"> 1. idea that (restored blood flow) provides (muscle /cells) with oxygen / removes lactic acid / eq ; 2. (aerobic) respiration {rate increases / restarts / eq} ; 	(2)
6)		
(a)(i)	antihypertensives / antihypertensive drug / beta blockers / diuretics / ACE inhibitors / calcium ion channel blockers / vasodilators / eq ;	(1)
(a)(ii)	<ol style="list-style-type: none"> 1. high blood pressure {can cause / increases risk of} {CVD / correctly named complication / description / eq} / eq ; 2. idea that older people are (more) at risk of {CVD/ eq} ; 	(2)
(b)(i)	<ol style="list-style-type: none"> 1. reference to (group B) as {control / comparison / check validity / eq} ; 2. both groups given two tablets / reference to placebo / eq ; 	(2)

7)

1. diastole ;	1. ALLOW ventricular diastole or atrial AND ventricular diastole (together) NOT atrial diastole by itself
2. atrium / atria ;	
3. ventricles ;	
4. atrioventricular / bicuspid / tricuspid ;	4. ALLOW AV , mitral
5. semilunar (valves) ;	5. ALLOW aortic valves
6. artery ;	
(6)	

8)

(a) (i)	1. glucose provides respiratory substrate / eq ; 2. to provide {energy / eq} for heart (muscle) {contraction / eq} ; 3. reference to osmotic effect ;	1. ALLOW needed / used for respiration 3. Can be expressed in a variety of ways eg solution is isotonic.	(2)
(a) (ii)	{glucose / pH } at same { concentration / volume / value / eq } ;	IGNORE references to caffeine and temperature etc. IGNORE amount	(1)
(a) (iii)	reference to replication procedure ;	ALLOW repeats, use more than one heart NOT repeat with different concentrations	(1)

a)(iv)	<ol style="list-style-type: none"> 1. the heart rate decreases (with increasing caffeine concentrations) above 0.1 (mg cm⁻³) / concentrations of a caffeine above {0.30 - 0.34 (mg cm⁻³)} the heart rate {decreases / is lower than base rate} / eq ; 2. up to a concentration of {0.30-0.34 (mg cm⁻³)} caffeine there is an increase in heart rate (above base rate) / eq ; 3. 0.1 (mg cm⁻³) caffeine causes the fastest heart rate / eq ; 4. credit correct manipulation of figures ; 	<p style="text-align: center;">(3)</p> <p>4. e.g. 20% increase with 0.1 (mg cm⁻³)</p>	
b)(i)	<ol style="list-style-type: none"> 1. details of method to limit movement of <i>Daphnia</i> ; 2. reference to determining base heart rate (in absence of caffeine) ; 3. reference to use of range of caffeine concentrations ; 4. acclimatisation of <i>Daphnia</i> (in each solution) / eq ; 5. details of method to determine heart rate; 6. repeats / replicates ; 7. Named control variable e.g. {source / size / age / type / eq} of <i>Daphnia</i>, temperature, pH ; 	<ol style="list-style-type: none"> 1. e.g. use of cotton wool IGNORE cavity slide 2. ALLOW measure heart rate in 0% caffeine NOT distilled water 5. eg dots on paper in a set time / use video camera IGNORE just counting 	(4)

(b)(ii)	chicken (embryo) {is a vertebrate / feels pain / will die / cannot give consent/ eq } ;	(1)
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