Question Number	Answer	Mark
1(a)(i)	C ;	(1) comp

Question Number	Answer	Mark
1(a)(ii)	A ;	(1) comp

Question Number	Answer	Mark
1(a)(iii)	B ;	(1) comp

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	1. idea of {reduced blood flow / bleeding} ; 2. {less/no} {oxygen /glucose} (reaches brain) ; 3. idea of {less/no} (aerobic) respiration ; 4. idea of {less / no} ATP produced ; 5. idea that brain needs lots of {energy / ATP} to function ; 6. lactic acid produced (from anaerobic respiration); 7. lactic acid {inhibits enzymes / toxic / eq };	IGNORE brain cell death 1. ACCEP no blood 2. CCEPT no oxygenated blood and this gets Mp1 as well 3. CCEPT anaerobic respiration (instead) 3. & 4 ACCEPT clearly linked ideas e.g. "cells will not receive enough oxygen for respiration" will gain mp 2 and 3.	(3) p

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	Any **two** from: 1. less saturated fat / less cholesterol ; 2. less salt ; 3. {less / moderate /eq} alcohol ; 4. Increase activity e.g. more / regular exercise, less sedentary job ; 5. reduce stress / eq ; 6. reduce smoking ; 7. reduce {body weight / BMI / obesity} / maintain healthy BMI / eq ;	Mps awarded if change correctly qualified e.g. IGNORE salt unqualified 1.IGNORE just 'better' diet, less fat	(2) grad

Question Number	Answer	Additional guidance	Mark
2	1. diastole ; 2. atrium / atria ; 3. ventricles ; 4. atrioventricular / bicuspid / tricuspid ; 5. semilunar (valves) ; 6. artery ;	1. AL W ventricular diastole or atrial AND ventricular diastole (together) NOT atrial diastole by itself 4. ALL AV , mitral 5. ALL aortic valves	**(6)**

Question Number	Answer	Additional guidance	Mark
3(a)(i)	1. Idea that there is a {thick wall / lots of collagen / thick layers / thick tunica media / eq} ; 2. Idea that it needs {to avoid rupture / to withstand high pressure / eq} ; 3. {elastic / muscular / eq} {layer / fibres / wall/ eq} ; 4. Control the flow of blood / maintain blood pressure / elastic recoil / eq ; 5. smooth endothelial wall / eq ; 6. to reduce {friction / resistance / eq} ; 7. semi lunar valve present ; 8. to prevent backflow (during diastole) ; 9. large lumen ; 10. idea of accommodating large volumes of blood / eq ; 11. branches ; 12. to supply blood to different parts of the body (including coronary arteries) / eq ;	Max 2 marks for structural features only. Functions need to be in correct context 1. AL W idea of folded wall 2. IGNORE damage alone ALLOW stretch to accommodate more blood 4. AL W to squeeze blood along 5. AL W smooth lining 7. IGNO no valves ALLOW aortic valve 9. IGNO narrow lumen	**(3)**

Question Number	Answer	Additional guidance	Mark
3(a)(ii)	1. capillary walls are one cell thick / eq ; 2. no {elastic tissue / collagen / muscle / multiple layers / eq } in the capillary (walls) ; 3. no valves in capillaries ; 4. capillaries have a very narrow lumen / eq ; 5. capillaries are porous / have pores;	ALLOW converse statements ALLOW statements that only mention capillary or vein – but do not credit same mark point twice 1. an 4. IGNORE capillaries are one cell thick alone	**(2)**

Question Number	Answer	Additional guidance	Mark
3(b)(i)	1. idea that the area of dead heart muscle will be {downstream of the atheroma / in region normally supplied by the blocked artery / eq} ; 2. idea that each artery supplies (cells) with {oxygen / glucose / oxygenated blood } ; 3. idea that {cells / muscle / tissue / eq} (supplied by the blocked vessel) will die due to lack of {energy / respiration} ; 4. idea that if the atheroma is located {near the end of an artery / in a small artery } then the area of dead muscle will be small ;	4. AL W converse	**(3)**

Question Number	Answer	Additional guidance	Mark
3(b)(ii)	1. shaded area should not extend above position B ; 2. shaded area should be around all the vessels on the right side of the diagram but not overlap with those on the left ;		**(2)**

Question Number	Answer	Mark
***4(a)QWC**	**Take into account quality of written communication when awarding the following points.** 1. idea that there are four chambers ; 2. correct reference to relative position of *atria* and *ventricles* ; 3. idea of left and right sides separate / *septum* ; 4. reference to muscular nature of walls ; 5. reference to *cardiac* muscle ; 6. idea of relative thickness of *ventricle* (walls) ; 7. correct reference to position of {*atrioventricular valves* / eq} ; 8. correct reference to position of *semilunar valves* ; 9. reference to position of {*tendons / tendinous cords / papillary muscles* / eq} ; 10. correct reference to position of {*aorta / pulmonary artery}* ; 11. correct reference to position of {*vena cava / pulmonary vein}* ; 12. correct reference to *coronary arteries* ; 13. reference to {*SAN / Sino Atrial Node / pacemaker/ AVN /Atrioventricular Node / Purkinje fibres /Purkyne fibres / Bundle of His/eq } ;*	**(5)**

Question Number	Answer	Mark
4(b)	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)**

Question Number	Answer	Mark
*** 5(a QWC**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 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)**

Question Number	Answer	Mark
5(b)(i)	{the alleles / eq} present (in an organism) / eq ;	**(1)**

Question Number	Answer	Mark
5(b)(ii)	a (different) form of one gene / eq ;	**(1)**

Question Number	Answer	Mark
5(c)	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 ;	**(1)**

Question Number	Answer	Mark
5(d)	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)**