

9. Transport in animals

9.2 Heart

Paper 3 and 4

Marking Scheme

Q1.

(a)(i)	X drawn, in the left atrium only / with a label line ending in left atrium ;	1	
(a)(ii)	<u>valve</u> ; valve identified with label line ;	2	
(a)(iii)	B and C ;	1	either order
(a)(iv)	septum ;	1	
(a)(v)	<u>muscle</u> ;	1	
(b)(i)	<i>any three from:</i> <i>similarities:</i> 1 CHD increases with age for males and females / AW / ora ; 2 In age group 0–34 no CHD in males and females / AW ; <i>differences:</i> 3 (overall) more males (than females) with CHD / ora ; 4 greatest difference (between males and females) is in age group 75–84 ; 5 use of comparative data quote between males and females ;	3	
(b)(ii)	<i>any three from:</i> diet ; lack of exercise / AW ; stress ; smoking ; genetic predisposition ; AVP ;	3	e.g. high blood pressure

Q2.

(a)	pump ; valves ;	2	
(b)(i)	<i>any two from:</i> pulse rate ; ECG ; listening to sounds of valves (closing) ;	2	
(b)(ii)	<i>a tick on each of:</i> As age increases the resting heart rate decreases till age 40 and then increases. ; From age 5 to 10 the resting heart rate decreases by 25 bpm. ;	2	R each additional tick
(c)	136(%) ;	2	MP1 correct calculation to any number of decimal places MP2 correct rounding to a whole number ecf from incorrect MP1 for MP2
(d)	<i>any three from:</i> 1 balanced diet ; 2 ref. to consuming correct number of calories / correct energy intake avoiding excess calories / avoid obesity ; 3 avoid (highly) processed food / AW ; 4 low fat diet / low saturated fat / higher levels of unsaturated fat / AW ; 5 low cholesterol diet ; 6 high fibre diet ; 7 low salt ; 8 low alcohol ; 9 (good diet) reduces or prevents, plaque formation / damage to, artery (walls) ; 10 reducing blockage of coronary arteries ;	3	

Q3.

(a)(i)	left ventricle ; septum ; valve ; right atrium ;	4	labels in this order starting clockwise from top right side of the diagram
(a)(ii)	vena cava ; pulmonary artery ; pulmonary vein ; aorta ;	4	
(b)	<i>any three from:</i> stress ; smoking ; genetic (predisposition) ; age ; sex ; AVP ;;; e.g. lack of exercise / high blood pressure / high (blood) cholesterol / diabetes / obesity	3	

Q4.

(a)(i)	<i>correct labelling of :</i> atrium ; septum ; ventricle ; valve ;	4	
(a)(ii)	B and C ; D ;	2	
(b)	<i>any two from:</i> ECG ; listening to the closing of the valves ; AVP ;	2	
(c)(i)	coronary arteries ;	1	

(c)(ii)	<i>any three from:</i> diet (or described); obesity ; stress ; smoking ; genetic predisposition ; age ; sex ; AVP ;;	3	
---------	--	---	--

Q5.

(a)(i)	1 pulse rates for both students increase, during exercise / at 10–15 minutes / for 5 minutes ; 2 pulse rate for both students plateau, during exercise / at 15–25 minutes / for 10 minutes / until 25 minutes ; 3 pulse rate for both students decreases, after exercise / at 25–40 minutes / for 15 minutes / until 40 minutes ; 4 both students, took the same amount of time to recover from exercise / get back to the same pulse rate as before exercise / AW ; 5 pulse rate for student B increases more than student A / AW ; 6 comparative data quote / manipulation, with units ;	4	
(a)(ii)	94(%) ;;	3	MP1 correct readings from graph of 64 and 124 MP2 correct calculation, i.e. 93.75(%) ecf wrong graph readings. MP3 correct rounding to whole number ecf MP2
(a)(iii)	any two from: ECG ; listening to the closing of the valves ; AVP ;	2	

Q6.

(c)(i)	high, fat / cholesterol / salt, diet ; smoking ; genetic predisposition ; age ; stress ; sex ; obesity ; lack of exercise / sedentary lifestyle / AW ; AVP ; high blood pressure / alcohol consumption	3	
(c)(ii)	coronary artery ;	1	

Q7.

(a)(i)	running ;	1	
(a)(ii)	125 (bpm) ;	1	
(a)(iii)	53 (%) ;	2	
(b)	ECG / listening to valves (closing) ;	1	A other correct methods

Q8.

(b)(i)	coronary arteries ;	1	
(b)(ii)	<i>any one from:</i> drug treatment: aspirin / AVP ; surgery: stents / angioplasty / (heart) bypass (operation) ;	1	

Q9.

(a)(i)	left ventricle ;	1	
(a)(ii)	<i>total of three from:</i> vena cava ; <i>max. two from:</i> has valves ; wide, lumen / AW ; thin wall ; (wall) lined by single layer of cells ; (wall) contains muscle (fibres) ; (wall) contains elastic (fibres) ;	3	
(a)(iii)	semilunar <u>valve</u> ; prevents backflow of blood (correctly described) / ensures that blood flows in one direction ;	2	

Q10.

(a)	<i>any four from:</i> valves in, heart / (main) veins ; correct sequence, of open / closing, of valves ; prevention of backflow / description ; semi-lunar valves ; atrioventricular valves ; heart, pumping / contracting ; AVP ;	4	
-----	---	---	--

Q11.

(a)(i)	coronary artery ;	1	
(a)(ii)	ref. to platelets ; fibrinogen converted to fibrin ; soluble to insoluble ; forms a mesh ; traps, (red blood) cells ;	3	
(a)(iii)	aspirin / AVP ;	1	
(b)(i)	98 (%) ;;;	3	one mark for correct readings from graph one mark for correct calculation one mark for correctly rounding to a whole number
(c)	more <u>blood</u> , to muscles ; to deliver more, oxygen / glucose ; for muscle <u>contraction</u> ; for (aerobic) respiration ; more <u>energy</u> required ; ref. to adrenaline ;	3	