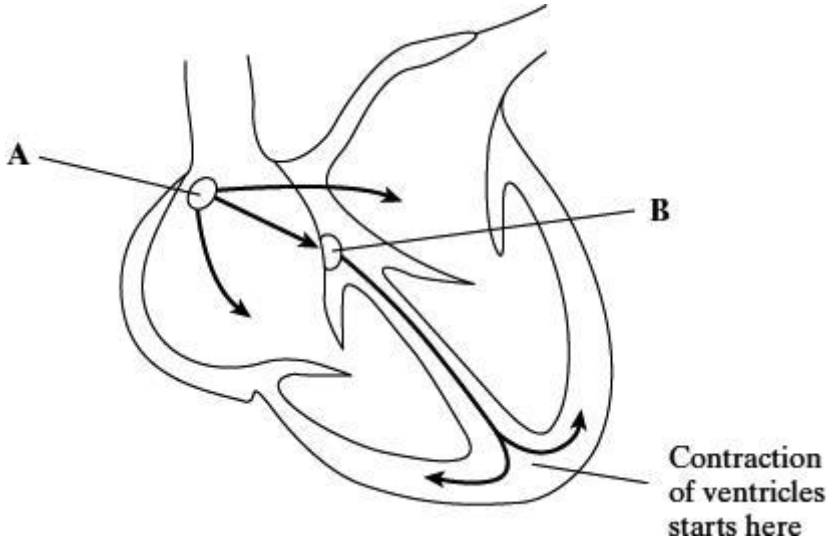
Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

The diagram shows the pathways in the heart for the conduction of electrical impulses during the cardiac cycle.



(a) The table shows the blood pressure in the left atrium, the left ventricle and the aorta at different times during part of a cardiac cycle.

	Blood pressure / kPa		
Time / s	**Left atrium**	**Left ventricle**	**Aorta**
0.0	0.5	0.4	10.6
0.1	1.2	0.7	10.6
0.2	0.3	6.7	10.6
0.3	0.4	17.3	16.0
0.4	0.8	8.0	12.0

(i) At which time is blood flowing into the aorta?

_____

(1)

(ii) Between which times are the atrioventricular valves closed?

Downloaded from www.merit-minds.com

_____

(1)

(b) The maximum pressure in the left ventricle is higher than the maximum pressure in the right ventricle. What causes this difference in pressure?

_____

_____

(1)

(c) The information below compares some features of different blood vessels.

		Blood vessel		
		Artery	**Capillary**	**Vain**
Property	Mean diameter of vessel	4.0 mm	8.0 μm	5.0 mm
	Mean thickness of wall	1.0 mm	0.5 μm	0.5 mm
		Relative thickness (shown by length of bar)		
Tissues present in wall	Endothelium			
	Elastic tissue			
	Muscle			

Use the information to explain how the structures of the walls of arteries, veins and capillaries are related to their functions.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

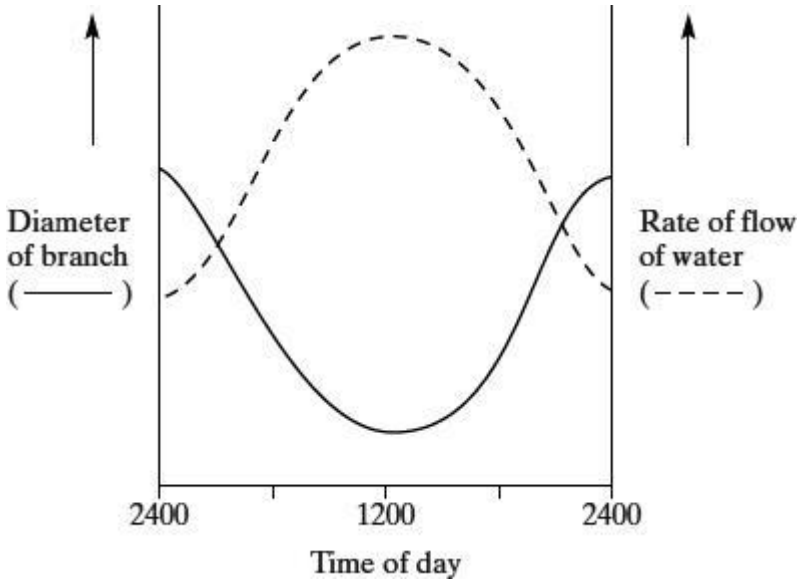
(6)

(Total 9 marks)

Downloaded from www.merit-minds.com

Q2.

(a) The diameter of a branch of a tree and the rate of flow of water through the branch were measured over a 24-hour period. The results are shown in the graph.



Using your knowledge of cohesion-tension theory

(i) describe and explain the changes in rate of flow of water in the branch over the 24 hour period;

_____

_____

_____

_____

_____

_____

(3)

(ii) explain why the diameter of the branch decreased during the first 12 hours.

_____

_____

(1)

(b) A stem was cut from a transpiring plant. The cut end of the stem was put into a solution of picric acid, which kills plant cells. The transpiration stream continued. Suggest an explanation for this observation.

_____

_____

_____

_____

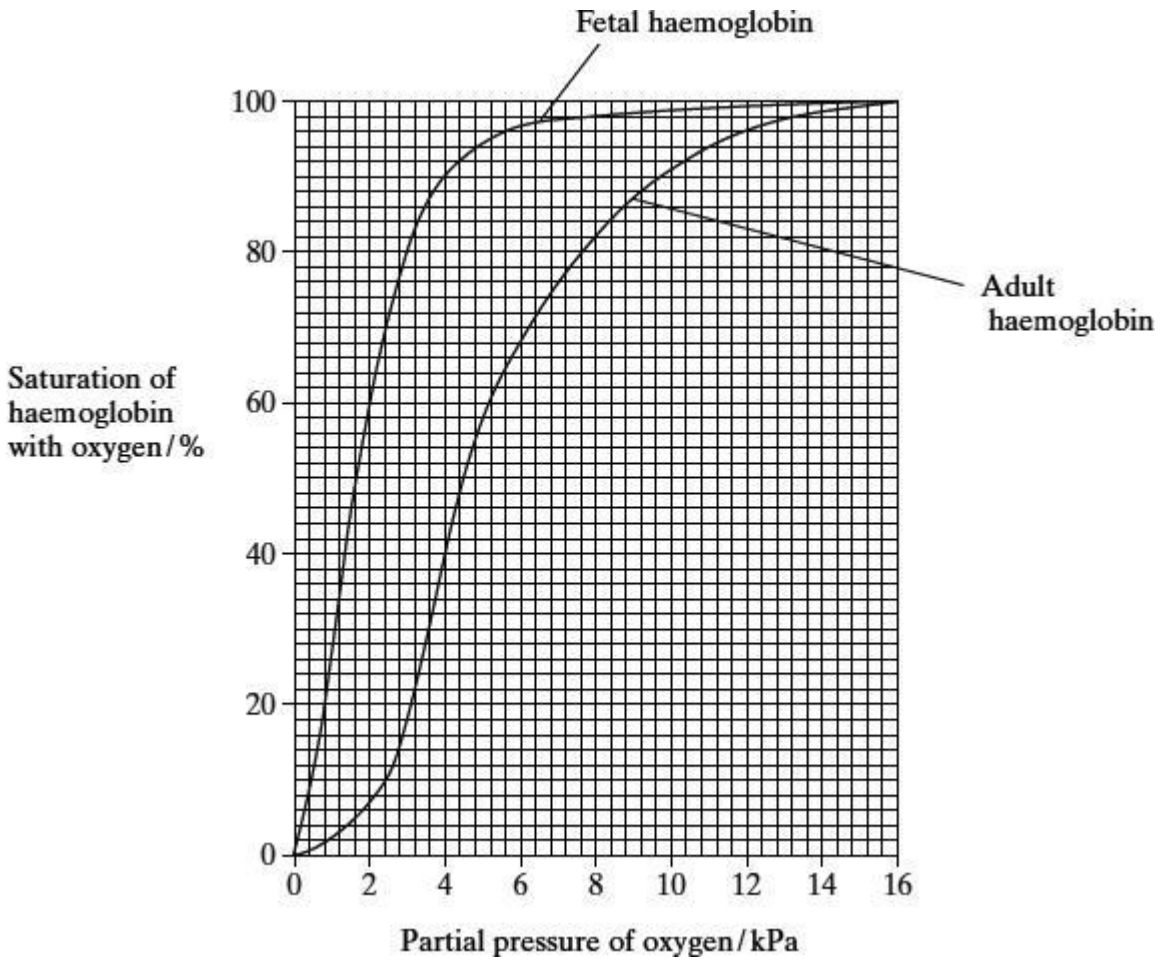
(2)

(Total 6 marks)

Downloaded from www.merit-minds.com

Q3.

The graph shows dissociation curves for haemoglobin in a fetus and in an adult.



(a) (i) What is the difference in percentage saturation between fetal haemoglobin and adult haemoglobin at a partial pressure of 3 kPa?

_____

(1)

(ii) Explain the advantage of the curve for fetal haemoglobin being different from the curve for adult haemoglobin.

_____

_____

_____

_____

(2)

(b) The dissociation curve for adult haemoglobin changes during vigorous exercise.

(i) Sketch on the graph the position of the curve during vigorous exercise.

(1)

(ii) Explain the advantage of this change in position.

_____

Downloaded from www.merit-minds.com

_____

_____

_____

(2)

(Total 6 marks)

Downloaded from www.merit-minds.com