

Mammalian Transport System & the Mammalian Heart (G)

AICE Biology Guided Reading

Answer each of the following questions using chapters 8 & 9 in Jones & Fosbery/chapter 50 in Raven.

Please answer these questions on your own.

Copying another student's work is not acceptable.

Chapter 8: Mammalian Transport System

Score ___/75

Cardiovascular System:

1. Answer SAQ's 8.1 & 8.2 (2)
2. Why is the surface area to volume ratio an important factor in determining whether waste removal by diffusion is effective for an organism? (1)
3. Why do more active organisms require a greater complexity in their systems of transport?(1)
4. Trace the path of a red blood cell through the cardiovascular system from the Iliac vein through your heart & lungs to your left arm by filling in the blanks below: (1)

Iliac vein → _____ → _____ → _____ → _____
 _____ → Lungs → _____ → _____ → _____
 _____ → Aorta → _____

5. Fill in the table below describing the defining features of each of the blood vessels. (4)

	De-ox or Ox blood	Blood to /away from heart	Size of vessel	Special features
Artery				
Arteriole				
Capillary				
Veinule				
Vein				

Arteries:

6. Answer SAQ 8.3 (1)
7. List & Describe the three layers of an artery. (3)
8. What is a pre capillary sphincter & what is its purpose (look in Raven) (1)

Capillaries:

9. Answer SAQ 8.4 (1)
10. Describe the function of capillaries & why they are so small (1)
11. Of all the tissues in the body, cartilage is one of the few with an inability to repair itself. Why is this the case? (1)

Veins:

12. Answer SAQ's 8.5, 8.6 & 8.7 (3)
13. Describe 2 adaptations are found in veins to overcome the problems of low blood pressure & working against gravity in returning blood to the heart? (2)

Blood Plasma & Tissue Fluid

14. Answer SAQ 8.8 (3)
15. Compare & contrast blood plasma and tissue fluid in terms of location & composition (2)
16. Describe how blood pressure & osmotic pressure work to control the movement of tissue fluid into & out of capillaries. (1)

Lymph

17. Answer SAQ 8.9 (2)
18. What is the purpose of lymphatics? Discuss how their structure facilitates their function. (2)
19. Why do your lymph nodes become swollen when you are sick with a cold or fever? (1)

Blood

Red Blood Cells

20. Answer SAQ's 8.10 & 8.11 (2)
21. In what 3 ways are erythrocytes atypical cells? - Describe. (3)

White Blood Cells

22. Describe the two main groups of leucocytes (2)

Haemoglobin: Haemoglobin Dissociation Curve

23. Answer SAQ 8.12 (2)
24. Why will a haemoglobin molecule more easily combine with a second (& 3rd & 4th) O₂ molecule than it will with a first O₂ molecule? (1)
25. What is Hhb? Discuss its role in buffering blood pH & facilitating the Bohr Shift. (2)

CO₂ Transport

26. Describe 3 ways CO₂ is carried away from cells by the blood. (3)

Fetal Haemoglobin

27. The lungs are among the last organs to develop as a fetus grows. Without functioning lungs, how does a fetus get the O₂ it needs? Be specific. (1)

Myoglobin

28. Where is myoglobin found & how does it differ from haemoglobin? (1)

Problems with Transport

29. Answer SAQ's 8.14, 8.15 & 8.16 (3)
30. Why is Carbon Monoxide (CO) so dangerous even at very low concentrations? (1)

Chapter 9:

The Mammalian Heart

31. Compare & contrast cardiac muscle with smooth & skeletal muscle (2)
32. Coronary arteries: where are they located & what is their function? (1)
33. Sketch a cross-section of the heart & label: right atrium, right ventricle, left ventricle, left atrium, mitral (bicuspid) valve, tricuspid valve, apex, septum. (2)

Cardiac cycle

34. Answer SAQ 9.1 (6)
35. Describe the following stages of the cardiac cycle: Atrial Systole, Ventricular Systole, Ventricular Diastole. (3)
36. Discuss the relative thickness of the myocardium in the atria, right ventricle & left ventricle. Justify by function for each. (3)

Control of the Heart Beat

37. Answer SAQ 9.2 (4)
38. Cardiac muscle is myogenic. What does this mean? (1)
39. Describe the function of the following in controlling the heart beat: Sinoatrial (SA) node, Atrioventricular (AV) node, Purkyne tissues (Purkinje Fibres) (3)
40. What is a fibrillation? (1)