

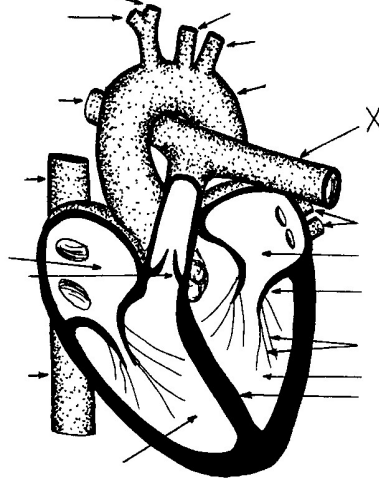
Circulatory System

Part A – Multiple Choice

1. The cardiac septum separates the
 - A. left and right atria.
 - B. left and right ventricles.
 - C. left atrium and left ventricle.
 - D. right atrium and right ventricle.
2. Which part of the heart controls the contraction of the atria?
 - A. Purkinje fibres.
 - B. Semilunar valve.
 - C. SA (sinoatrial) node.
 - D. AV (atrioventricular) node.
3. Which of the following correctly describes the movement of blood through the heart during the heart cycle?
 - A. From atria to ventricles and then to veins.
 - B. From ventricles to atria and then to veins.
 - C. From atria to ventricles and then to arteries.
 - D. From ventricles to atria and then to arteries.
4. The chordae tendineae of the heart help to prevent the backflow of blood from the
 - A. atria into the ventricles.
 - B. ventricles into the atria.
 - C. ventricles into the aorta and pulmonary trunk.
 - D. aorta and pulmonary trunk into the ventricles.
5. What valve opens when the heart chamber producing the highest blood pressure contracts?
 - A. The aortic semi-lunar valve.
 - B. The left atrioventricular valve.
 - C. The right atrioventricular valve.
 - D. The pulmonary semi-lunar valve.
6. The natural pacemaker of the heart is located in the
 - A. left atrium.
 - B. right atrium.
 - C. left ventricle.
 - D. right ventricle.
7. Which of the following describes the correct sequence of activity for the coordination of the heartbeat?
 - A. SA node, AV node, Purkinje fibers.
 - B. AV node, SA node, Purkinje fibers.
 - C. Purkinje fibers, SA node, AV node.
 - D. AV node, Purkinje fibers, SA node.
8. Which of the following occurs during ventricular systole?
 - A. Atria recover and ventricles recover.
 - B. Atria contract and ventricles recover.
 - C. Atria recover and ventricles contract.
 - D. Atria contract and ventricles contract.
9. The AV valves of the heart are prevented from inverting by the
 - A. chordae tendineae.
 - B. direction of blood flow.
 - C. sphincter muscles in the heart.
 - D. force of blood leaving the ventricles.

10. Which of the following happens when the brain increases its stimulation of the SA node?
- Heart rate and blood pressure decrease.
 - Mesenteric arteries and arterioles dilate.
 - Blood pressure and blood velocity increase.
 - Production of red blood cells and platelets increase.
11. When the AV valves are opened and the blood is moving through them,
- both the atria and ventricles are relaxing.
 - both the atria and ventricles are contracting.
 - the atria are contracting and the ventricles are relaxing.
 - the atria are relaxing and the ventricles are contracting.

Use the following diagram to answer the next question.



12. Which of the following correctly identifies structure X and the composition of blood it contains?

	Structure X	Composition of Blood
A.	vein	high O ₂ content
B.	vein	low O ₂ content
C.	artery	high O ₂ content
D.	artery	low O ₂ content

13. Which arteries conduct blood to the intestines?
- Iliac.
 - Renal.
 - Hepatic.
 - Mesenteric.

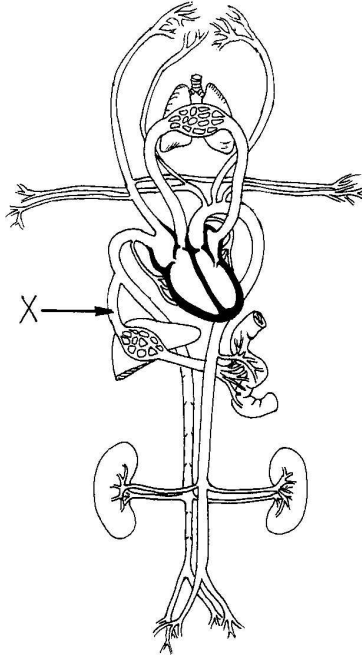
Use the following diagram to answer the next question.



14. The feature illustrated is characteristic of
- a vein.
 - an artery.
 - a capillary.
 - all types of blood vessels.

15. Which of the following describes the location and function of valves found in the circulatory system?
- Found in capillary beds and they regulate the diameter of venules.
 - Found in blood vessels with low blood pressure and they prevent the backflow of blood.
 - Found in blood vessels where blood is moving fastest and they control blood entering capillaries.
 - Found in blood vessels carrying blood away from the heart and they limit high blood pressure.
16. Which of the following has the greatest total cross sectional area of blood vessels?
- Capillaries.
 - Venous system.
 - Arterial system.
 - Pulmonary system.
17. If the sphincter muscles of arterioles to the skin constrict,
- Blood flow to the skin will be increased and blood pressure in the skin will be increased.
 - Blood flow to the skin will be decreased and blood pressure in the skin will be increased.
 - Blood flow to the skin will be increased and blood pressure in the skin will be decreased.
 - Blood flow to the skin will be decreased and blood pressure in the skin will be decreased.
18. The dilation of arterioles to the skin results in a decrease in
- heart rate.
 - blood pressure.
 - body temperature.
 - capillary fluid exchange.
19. The blood vessel that serves the heart muscle is the
- systemic artery.
 - coronary artery.
 - pulmonary artery.
 - left carotid artery.
20. Which of the following most correctly describe the function of the carotid arteries?
- They conduct blood to the aorta.
 - They conduct nutrients to the heart.
 - They conduct oxygenated blood to the head.
 - They conduct deoxygenated blood to the lungs.
21. In which of the following vessels are glucose levels the **LEAST** variable?
- Renal artery.
 - Hepatic vein.
 - Pulmonary vein.
 - Hepatic portal vein.
22. How many heart valves would a blood cell traveling from the renal vein to the pulmonary vein pass through?
- None.
 - One.
 - Two.
 - Three.
23. Which pair of blood vessels are the main pathways for blood in the systemic circuit?
- Aorta and vena cava.
 - Aorta and pulmonary artery.
 - Vena cava and iliac artery.
 - Pulmonary artery and vena cava.

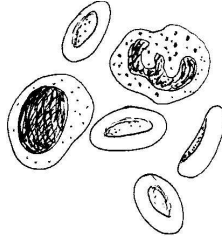
Use the following diagram to answer the next question.



24. What is the blood vessel labeled **X**?
- A. Renal vein.
 - B. Hepatic vein.
 - C. Inferior vena cava.
 - D. Hepatic portal vein.
25. Systemic circulation circulates blood from the
- A. left ventricle to left atrium.
 - B. right atrium to left ventricle.
 - C. left ventricle to right atrium.
 - D. right ventricle to right atrium.
26. A blood clot forms in the hepatic vein but breaks off and lodges in the next capillary bed it encounters. Where would it be found?
- A. liver.
 - B. brain.
 - C. lungs.
 - D. small intestine.
27. After blood leaves the right ventricle, it next returns to the heart
- A. oxygenated via the left atrium.
 - B. oxygenated via the right atrium.
 - C. deoxygenated via the left atrium.
 - D. deoxygenated via the right atrium.
28. Which blood vessels transport deoxygenated blood?
- A. Umbilical vein and pulmonary vein.
 - B. Umbilical vein and pulmonary artery.
 - C. Umbilical arteries and pulmonary vein.
 - D. Umbilical arteries and pulmonary artery.
29. Which of the following is **TRUE** about the umbilical arteries?
- A. There are two of them and they conduct oxygenated blood into the fetus.
 - B. They join together to form the umbilical vein that conducts oxygenated blood to the fetus.
 - C. They are branches of the fetal iliac arteries and they conduct deoxygenated blood to the mother.
 - D. They are branches of the fetal iliac arteries and they receive oxygenated blood from the umbilical vein.

30. Besides the oval opening, which other fetal circulatory structure allows blood to bypass the lungs?
- A. Venous duct.
 - B. Arterial duct.
 - C. Umbilical vein.
 - D. Umbilical artery.
31. Blood pressure would normally be expected to be elevated due to all of the following **EXCEPT**
- A. fear.
 - B. rapid pulse.
 - C. dehydration.
 - D. atherosclerosis.
32. The connective tissue in which cells are separated by a liquid called plasma is
- A. blood.
 - B. serum.
 - C. lymph.
 - D. extracellular fluid.
33. All of the following may be found dissolved in blood **EXCEPT**
- A. oxygen.
 - B. glucose.
 - C. glycogen.
 - D. fibrinogen.
34. Which of the following **BEST** describes the shape of a red blood cell?
- A. Oval.
 - B. Spherical.
 - C. Biconcave.
 - D. Amoeboid.
35. The mineral in blood essential for the clotting process is
- A. iron.
 - B. sodium.
 - C. calcium.
 - D. phosphorous.
36. What do white blood cells produce and release to deactivate bacteria or viruses?
- A. Platelets.
 - B. Antigens.
 - C. Antibodies.
 - D. Hemoglobin.
37. Which of the following pairs are needed to fight infection?
- A. Leukocytes and proteins.
 - B. Thrombocytes and proteins.
 - C. Leukocytes and erythrocytes.
 - D. Erythrocytes and thrombocytes.
38. Agglutination is different from clotting because
- A. it occurs in plasma.
 - B. it involves proteins and cells.
 - C. it causes cells to cluster together.
 - D. it is a function of the immune system.

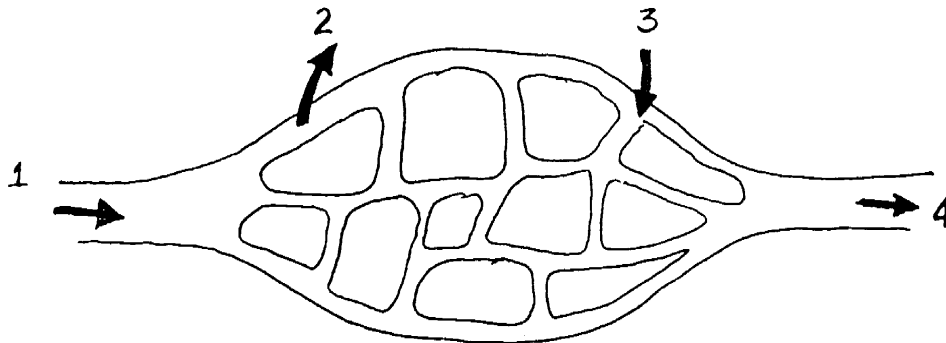
Use the following diagram to answer the next question.



39. The cells illustrated **CANNOT** conduct which of the following functions?
- A. Phagocytosis.
 - B. Clotting blood.
 - C. Transporting oxygen.
 - D. Production of antibodies.
40. Which of the following accounts for the return of water to plasma at the venule end of a capillary bed?
- A. Diffusion.
 - B. Blood pressure.
 - C. Active transport.
 - D. Osmotic pressure.
41. Excess fluid remaining in tissue spaces will be
- A. used to form urine.
 - B. removed in the form of sweat.
 - C. drained away by the lymphatic system.
 - D. moved back into the capillary bed at a later time.
42. What occurs on the venous side of a capillary bed?
- A. Urea and ammonia exit into the tissues.
 - B. Carbon dioxide and glucose enter the bloodstream.
 - C. Blood pressure forces water to exit into the tissues.
 - D. Osmotic pressure causes water to move into the blood.
43. Which of the following describes the changes in the osmotic pressure along a capillary bed from the arteriole end to the venule end?
- A. It increases.
 - B. It decreases.
 - C. It decreases then increases.
 - D. It increases then decreases.
44. One factor that can cause edema, the accumulation of extracellular fluid in tissues, is a decrease in
- A. blood pressure.
 - B. food nutrients in blood.
 - C. the fluid volume of blood.
 - D. concentration of plasma proteins.
45. The lymphatic system consists of
- A. vessels with valves.
 - B. AV and semilunar valves.
 - C. the pulmonary artery and the arterial duct.
 - D. the umbilical artery and the pulmonary vein.

Part B – Written Answers

- What is the circulatory significance of a baby's first breath?
 - What natural events in the circulatory system follow the first breath?
- Describe the pathway that blood would have to follow to get from the fingers to the toes.
- What is the effect of arterial vasoconstriction on the following?
 - volume of blood flow?
 - blood pressure?
- What is nodal tissue? What is unique about it and where can it be found in the body?
 - Describe the roles of nodal tissue in maintaining the cardiac cycle.
 - Explain **ONE** mechanism the body has that can adjust the intrinsic heart rate?
- Identify and explain **ONE** relationship between each of the following.
 - globulins and blood clotting
 - leukocytes and agglutination
- Describe **TWO** roles of the lymphatic system.
- Explain** the role of diffusion between cells and their extracellular fluids. Use examples of substances that are transported in blood in your explanation.
- Use the following diagram of a capillary bed in muscle tissue to answer the following questions:



- Contrast** the composition of blood between position **1** and position **4**.
- Contrast** the event that is occurring at position **2** with the event occurring at position **3**.