

Name \_\_\_\_\_

1. After acetylcholine binds to the receptors on the motor end plate,
  - A. the triads wrap around the sarcomere.
  - B. the cross-bridges detach.
  - C. the action potential travels down to the terminal cisternae to release  $\text{Ca}^{2+}$
  - D. the sarcolemma releases  $\text{Ca}^{2+}$  ions.
  
2. When the partial pressure of oxygen in an alveolar sac is low,
  - A. bronchoconstriction of the bronchioles leading to that sac will occur.
  - B. vasoconstriction of the capillary bed perfusing that sac will occur.
  - C. vasodilation of the capillary bed perfusing that sac will occur.
  - D. None of the above will occur.
  
3. When the dorsal respiratory group is stimulated,
  - A. the diaphragm contracts.
  - B. the diaphragm relaxes.
  - C. exhalation occurs.
  - D. active breathing begins.
  
4. Anemia is
  - A. when oxygen delivery to peripheral tissues is interfered with.
  - B. the result of an increase in hematocrit.
  - C. always caused by hemorrhage.
  - D. a result of leukocytosis.
  
5. Which of the following is correct?
  - A. Calcium is responsible for moving the troponin-tropomyosin complex away from the myosin binding site on actin.
  - B. ATP is responsible for moving the troponin-tropomyosin complex away from the myosin binding site on actin.
  - C. Calcium is responsible for separating the actin-myosin cross bridges.
  - D. ATP is responsible for causing calcium to be released into the sarcomere.
  
6. The muscle type we have conscious control over is
  - A. skeletal muscle.
  - B. smooth muscle.
  - C. cardiac muscle.
  
7. The type of muscle fiber that is most resistant to fatigue is the \_\_\_\_\_ fiber.
  - A. fast
  - B. slow
  - C. intermediate
  
8. A person with a low hematocrit (below the normal range)
  - A. does not produce erythropoietin.
  - B. has polycythemia.
  - C. does not have albumins.
  - D. may have aplastic anemia.

9. What step of the cardiac cycle will start during the QRS complex of the ECG?
- A. isovolumetric relaxation.
  - B. ventricular diastole.
  - C. isovolumetric contraction.
  - D. ventricular filling.
10. For a B cell to become active,
- A. cytotoxic T cells must bind to the MHC complex on the B cell.
  - B. plasma cells must differentiate into B cells.
  - C. cytokines (local hormones) are released from helper T cells to initiate the process.
  - D. memory B cells have to bind with suppressor T cells to differentiate into activated B cells.
11. Increased oxygen consumption by muscle fibers would accompany all of the following EXCEPT
- A. increased aerobic respiration.
  - B. increased muscle activity.
  - C. decreased ATP use.
  - D. increased heat production.
12. When a person with Type B blood is infused with Type O blood,
- A. the anti-B antibodies in the Type O blood will cause a massive agglutination.
  - B. the anti-A antibodies in the Type B blood will react with the antibodies in the Type O blood.
  - C. the anti-O antibodies in the Type B blood will react with the surface antigens of the Type O blood.
  - D. no adverse reaction will occur.
13. After getting a small cut on your finger, you would probably experience
- A. leukopenia.
  - B. leukocytosis.
  - C. leukemia.
  - D. anemia.
14. Internal respiration
- A. refers to gas exchange between alveoli and blood in pulmonary capillaries.
  - B. will only occur if the partial pressure of oxygen in the blood is low.
  - C. cannot happen if compliance is decreased.
  - D. occurs between blood and tissue beds throughout the body.
15. Which part of the sarcomere is where actin and myosin interact?
- A. Z line.
  - B. Zone of overlap.
  - C. I band.
  - D. H zone.
16. A motor neuron becomes activated. This information must reach the muscle fiber by way of the
- A. junctional folds.
  - B. neuromuscular junction.
  - C. sarcolemma.
  - D. mitochondria.

17. Rapid ejection of blood from the left ventricle occurs
- A. during ventricular diastole.
  - B. before isovolumetric contraction.
  - C. after end-systolic volume.
  - D. when the pressure in the ventricle is greater than the pressure in the aorta.
18. A person who smokes will have all of the following EXCEPT
- A. increased erythropoietin release.
  - B. damaged respiratory membranes.
  - C. an overloaded respiratory defense system.
  - D. a decreased lung compliance.
19. To adequately perfuse peripheral tissues, cardiac output needs to be approximately 5 L/min. An athlete typically has a very low heart rate (~50 beats/min). Which of the following is true?
- A. An athlete does not receive enough blood to peripheral tissues because his/her cardiac output is too low.
  - B. An athlete's heart can pump blood more efficiently, thereby increasing stroke volume and allowing a slower heart rate.
  - C. An athlete will not have a cardiac output around 5 L/min.
  - D. An athlete has more parasympathetic stimulation of the heart than sympathetic, thereby giving him/her a lower heart rate.
20. Which of the following is true regarding the viscosity of blood?
- A. Water is five times more viscous than blood.
  - B. Albumins, globulins, and fibrinogen contribute to the viscosity of blood.
  - C. Blood is almost as viscous as water because it is 92% water
  - D. Because 99.9% of whole blood is composed of formed elements, blood is five times more viscous than water.
21. Vasoconstriction results in
- A. increased capillary blood flow.
  - B. decreased peripheral blood pressure.
  - C. increased afterload.
  - D. decreased resistance to blood flow.
22. Atherosclerosis
- A. is more likely in a person with high levels of apolipoprotein-E.
  - B. is due to cholesterol-rich lipoproteins remaining in circulation for an extended period of time.
  - C. cannot be reversed at any stage.
  - D. can only be treated with a coronary artery bypass graft.
23. The respiratory membrane includes
- A. surfactant cells.
  - B. goblet cells.
  - C. endothelial cells of capillaries.
  - D. ciliated cells.

24. While measuring blood pressure,
- A. the inflated cuff decreases blood flow through the vessel, but doesn't stop it completely.
  - B. the first sound after releasing the air is diastolic pressure.
  - C. the pressure at which there is no more sound (after releasing air) is systolic pressure.
  - D. the brachial artery is compressed until it is collapsed, and then air is slowly let out of the sphygmomanometer.
25. The greater the filling time,
- A. the greater the end-systolic volume.
  - B. the greater the stroke volume.
  - C. the greater the end-diastolic volume.
  - D. A and B are correct.
  - E. B and C are correct.
26. Once a T cell recognizes an MHC protein and its presented antigen,
- A. antigen-presentation will occur.
  - B. specific types of T cells will become activated, depending on the type of cell presenting the antigen.
  - C. memory T cells will cause an increase in the suppressor T cell population.
  - D. the cell housing the antigen will immediately be destroyed.
27. When arterial blood pressure increases,
- A. baroreceptor output decreases.
  - B. cardiac output will reflexively decrease.
  - C. the carotid sinuses will remain inactive but the aortic sinuses will become active.
  - D. stroke volume will decrease due to less venous return.
28. The functions of the lymphatic system include all of the following EXCEPT
- A. produce lymphocytes.
  - B. maintain normal blood volume.
  - C. maintain body temperature.
  - D. distribute lymphocytes to defend against infections.
29. A person suffering from hypocalcemia will have
- A. weak or no cardiac contractions.
  - B. an increased body temperature.
  - C. anemia.
  - D. highly excitable cardiac muscle cells.
30. A patent ductus arteriosus
- A. will allow blood to travel from the right atrium to the left atrium.
  - B. will cause blood to by-pass the lungs.
  - C. will result in a decreased cardiac output.
  - D. is a normal condition in a newborn.

31. After you have been sick, you have developed a(n)
- active, acquired natural immunity.
  - active, acquired induced immunity.
  - innate immunity.
  - passive, acquired, natural immunity.
32. When arterial blood pressure increases,
- net filtration pressure becomes more positive.
  - blood colloid osmotic pressure increases.
  - less fluid reaches the lymphatic capillaries.
  - capillary hydrostatic pressure decreases.
33. Functions of the respiratory system include all of the following EXCEPT
- protecting respiratory surfaces from dehydration.
  - defending the respiratory system and other tissues from pathogenic invasion.
  - providing an extensive area for gas exchange between air and circulating blood.
  - preventing choking from accidental respiration of food.
34. Which of the following is a correct match between the type of T cell and its function?
- Cytotoxic T cells secrete cytokines that stimulate T cell activation while enhancing non-specific defenses.
  - Suppressor T cells help limit the degree of the immune system response.
  - Helper T cells suppress the responses of T and B cells.
  - Memory T<sub>c</sub> cells differentiate into helper T cells as the infection proceeds.
35. Inhalation will occur when
- the volume in the thoracic cavity increases.
  - the pressure in the throacic cavity decreases.
  - the volume in the thoracic cavity decreases.
  - A and B are correct.
  - B and C are correct.
36. Bronchioles control airflow in the respiratory system like the way \_\_\_\_\_ control blood flow in the cardiovascular system.
- |                     |                       |
|---------------------|-----------------------|
| A. elastic arteries | C. capillaries        |
| B. arterioles       | D. medium-sized veins |
37. In response to a second exposure to an antigen, the immune system responds faster and stronger. This is due to
- |                 |                 |            |               |
|-----------------|-----------------|------------|---------------|
| A. specificity. | B. versatility. | C. memory. | D. tolerance. |
|-----------------|-----------------|------------|---------------|
38. Which of the following is typically GREATER?
- The partial pressure of oxygen in alveoli.
  - The partial pressure of oxygen in blood in the pulmonary artery.

39. Surfactant
- A. protects the surfaces of the lungs.
  - B. is not found in healthy lung tissue.
  - C. helps prevent alveoli from collapsing.
  - D. is produced in someone with cystic fibrosis.
40. Air entering the respiratory bronchioles
- A. has passed through the conducting portion of the respiratory tract.
  - B. has been warmed, filtered, and humidified.
  - C. has passed through the respiratory portion of the respiratory tract.
  - D. A and B are correct.
  - E. B and C are correct.
41. Which of the following is a correct difference between non-specific and specific defenses?
- A. Non-specific defenses are developed in the body after birth, due to exposure.
  - B. The non-specific defenses are the first to be activated when a bacterial infection occurs.
  - C. Specific defenses are present at birth.
  - D. Cell-mediated immunity is a type of non-specific defense.
42. Which will cause a GREATER diameter of bronchioles?
- A. sympathetic activation
  - B. parasympathetic activation
43. When compliance decreases,
- A. a person has emphysema.
  - B. more energy is required for breathing.
  - C. the lungs are healthy.
  - D. gas exchange is inhibited.
44. Scientists have recently discovered that nitric oxide (NO) is a neurotransmitter that causes smooth muscle cells to relax. Therefore,
- A. when NO is released, vasoconstriction will occur.
  - B. when NO is released, vasodilation will occur.
  - C. NO is only important in the central nervous system.
  - D. capillary blood flow will decrease after NO is released.
45. For ventricular filling to occur
- A. the AV valves need to be open.
  - B. the semilunar valves need to be open.
  - C. the atria need to be relaxed.
  - D. all valves need to be closed.

SCB 203.1752

Essay

Name \_\_\_\_\_

Pick ONE of the following and be sure to indicate which one you are writing about.

1. Explain muscle excitation and contraction, including what makes it stop.
2. Explain the cardiac cycle as it applies to the left ventricle.
3. Explain the three gas laws as they relate to respiration.

Extra credit essay:  
Explain the roles of the respiratory rhythmicity centers in breathing.