

Final Exam A February 24, 2006

Read each question carefully and choose the best answer!

1. Lymph from all areas except the right side of the body superior to the diaphragm is received by the:
  - a. Right lymphatic duct.
  - b. Left lymphatic duct.
  - c. Thoracic duct.
  - d. Lymphatic duct.
  - e. None of the above.
  
2. Which of the following is considered a type of lymphocyte?
  - a. Cytotoxic T cells.
  - b. Natural killer cells.
  - c. Suppressor T cells.
  - d. Bone marrow derived cells.
  - e. They all are types of lymphocytes.
  
3. Which of the following is a false statement regarding the spleen?
  - a. A source for red blood cell production.
  - b. The largest collection of lymphoid tissue in the human body.
  - c. Functions to store iron recycled from red blood cells.
  - d. Removal of abnormal blood cells by phagocytosis.
  - e. Initiates the immune responses by B cells and T cells in response to antigens circulating in blood.
  
4. Which of the following is not a non-specific defense of the human body?
  - a. Skin.
  - b. Immunological surveillance by natural killer cells.
  - c. Interferons.
  - d. Complement proteins.
  - e. Cell and antibody mediated immunity.
  
5. Which of the following is true about the major histocompatibility complex proteins?
  - a. Foreign MHC proteins are a major cause for graft rejection.
  - b. MHC proteins bind to antigens.
  - c. MHC proteins may be divided into class I and II MHC proteins.
  - d. MHC proteins are involved in T cell recognition.
  - e. All are true statements regarding MHC proteins.

6. Which of the following statements is false regarding antibodies?
- Antibodies are divided into 5 groups: IgG, IgE, IgD, IgM and IgA.
  - Antibodies are composed of 2 pairs of polypeptides called the heavy and light chains.
  - Antibodies are composed of constant and variable segments.
  - Antibodies are produced by bone marrow derived cells.
  - Antibody specificity is dependent on the constant segments.
7. The formation of an antibody complex may eliminate the antigen by:
- Neutralization.
  - Precipitation and agglutination.
  - The attraction of macrophages.
  - Opsonization.
  - All of the above.
8. In which of the following structures would you find acetylcholinesterase?
- Synaptic terminal.
  - Motor end plate.
  - Neuromuscular junction.
  - Synaptic cleft.
  - Transverse tubule.
9. The type of contraction in which tension rises but the resistance does not move is:
- A tetanic contraction.
  - A twitch.
  - An isotonic contraction.
  - An isometric contraction.
  - A concentric contraction.
10. Which of the following proteins will bind calcium and as a result will eventually lead to the exposure of the active sites on actin?
- Nebulin.
  - Titin.
  - Tropomyosin.
  - Myosin.
  - Troponin.

11. A movement that increases the angle between articulating elements is called:
- Flexion.
  - Abduction.
  - Rotation.
  - Circumduction.
  - Extension.
12. When a skeletal muscle fiber contracts:
- H zones get bigger.
  - I bands get bigger.
  - Z lines get further apart.
  - Zones of overlap get larger.
  - A bands get larger.
13. Which of the following is not part of the thin filaments:
- Myosin.
  - Actin.
  - Nebulin.
  - Tropomyosin.
  - Troponin.
14. Stimulating a skeletal muscle immediately after relaxation will produce a larger contraction. This phenomenon is known as:
- Incomplete tetanus.
  - Complete tetanus.
  - Treppe.
  - Twitch.
  - Wave summation.
15. Contraction does not occur immediately after stimulation in a myogram because:
- Acetylcholinesterase activity is too high.
  - It is the resting phase.
  - It is the relaxation phase.
  - It takes time to depolarize and release calcium.
  - None of the above is correct.

16. The QRS complex in an electrocardiogram represents:
- Atrial depolarization.
  - Atrioventricular node conduction.
  - Ventricular repolarization.
  - Sinoatrial node conduction.
  - None of the above.
17. A cardiac arrhythmia is due to:
- Abnormal cross bridge formation.
  - Abnormal closure of the heart.
  - Abnormal calcium release.
  - Abnormal patterns of electrical activity.
  - Abnormal relaxation.
18. The direct stimulus to release calcium from the sarcoplasmic reticulum for cardiac contraction is the:
- Action potential depolarizing the transverse tubules.
  - Direct interactions with proteins of the sarcolemma.
  - Calcium entering from the sarcolemma.
  - Sodium entering from the sarcolemma.
  - Potassium leaving from the sarcolemma.
19. The amount of blood remaining after ventricular contraction is called the:
- End diastolic volume.
  - Cardiac output.
  - Ejection fraction.
  - Stroke volume.
  - End systolic volume.
20. Baroreceptors are free nerve endings within the elastic tissue of the carotid sinus that senses:
- Oxygen.
  - Carbon dioxide.
  - Stretch.
  - Pressure.
  - pH.

21. Which of the following equations is incorrect?
- $CO = HR \times SV$ .
  - Net filtration pressure = net hydrostatic pressure – net colloid pressure.
  - Flow = Pressure/resistance
  - Respiratory minute volume = breaths/minute x tidal volume.
  - $SV = ESV - EDV$ .
22. In cardiac muscle there is a period during which a second action potential will not occur no matter how strong the stimulus. This is known as the:
- Relative refractory period.
  - Latent period.
  - Absolute refractory period.
  - Resting period.
  - Repolarization period.
23. The plateau phase of an action potential is primarily due to:
- Fast sodium channels opening.
  - Slow calcium channels opening.
  - Slow potassium channels opening.
  - Chloride channels opening.
  - Calcium channels closing.
24. The primary pacemaker of the heart is located in the:
- Atrioventricular node.
  - Bundle of His.
  - Right and left bundle branches.
  - Purkinje fibers.
  - None of the above.
25. A blockage due to the formation of a clot is called:
- Thrombosis.
  - Atherosclerosis.
  - Arrhythmia.
  - Ischemia.
  - None of the above.

26. Blood types are categorized by:
- Hematocrit.
  - Cell surface antigens.
  - Presence of antibodies.
  - Differential count.
  - Reticulocyte count.
27. Place the following list of steps involved in the process of hemostasis in the correct order:
- 1) Coagulation. 2) Fibrinolysis. 3) Vascular spasm. 4) Retraction. 5) Platelet Phase.
- 5, 1, 4, 2, 3.
  - 3, 5, 1, 4, 2.
  - 2, 3, 5, 1, 4.
  - 3, 5, 4, 1, 2.
  - 4, 3, 5, 2, 1.
28. Factor X directly activates:
- Prothrombin.
  - Thrombin.
  - Prothrombinase.
  - Fibrin.
  - Fibrinogen.
29. Erythropoiesis is:
- Red blood cell death.
  - Red blood cell damage.
  - Red blood cell formation.
  - Red blood cell loss.
  - Red blood cell lysis.
30. I belong to the largest group of white blood cells. My nucleus is lobed and I have granules that are difficult to stain. I am a:
- Neutrophil.
  - Eosinophil.
  - Basophil.
  - Monocyte,
  - Lymphocyte

31. Which of the following are not considered white blood cells or leucocytes?
- Neutrophils.
  - Eosinophils.
  - Basophils.
  - Lymphocytes.
  - Platelets.
32. A hemoglobin molecule is composed of
- Two polypeptide chains.
  - Four polypeptide chains and nothing else.
  - Two polypeptide chains and two heme groups.
  - Two polypeptide chains and four heme groups.
  - Four polypeptide chains and four heme groups.
33. Which of the following is false about arteries and veins?
- Veins are generally thinner than arteries.
  - Veins tend to collapse whereas arteries can recoil to constrict the lumen.
  - Veins have valves.
  - Veins have endothelial folds.
  - Veins are generally lower in pressure than arteries.
34. Which of the following is a true statement regarding capillaries?
- Have a tunica media and tunica externa.
  - Contains several layers of smooth muscle.
  - Have slow blood flow for diffusion.
  - Have thick walls.
  - All of the statements are true.
35. Cardiovascular function is regulated by all of the following except:
- Local factors.
  - Neural factors.
  - Endocrine factors.
  - Venous return.
  - Conscious control.

36. A blood vessel with high capacitance such as a vein:
- Will have a high blood pressure at a given volume of blood.
  - Will have a high resistance at a given blood volume.
  - Will hold a small amount of blood at a high pressure.
  - Will have a high blood pressure and high resistance.
  - Will hold a large volume of blood at a given pressure.
37. Reabsorption occurs at the venule side of a capillary because the:
- Blood colloid osmotic pressure is larger than the capillary hydrostatic pressure.
  - Net filtration pressure is a positive number.
  - Capillary hydrostatic pressure is larger than the blood colloid osmotic pressure.
  - The Blood colloid osmotic pressure equals the capillary hydrostatic pressure.
  - None of the above.
38. The fusion of two collateral arteries that supply a capillary bed is an example of:
- Metarteriole.
  - Thoroughfare channel.
  - Arterial anastomosis.
  - Precapillary sphincter.
  - Arteriovenous anastomosis.
39. The formed elements of the blood include:
- Plasma, fibrin and serum.
  - Albumins, globulins and fibrinogen.
  - WBCs, RBCs, and platelets.
  - RBCs, platelets and serum.
  - WBCs, platelets and serum.
40. The best explanation for the mechanism involved in asphyxiation from exhaust fumes is:
- A higher affinity for oxygen.
  - A higher affinity for nitrogen.
  - A higher affinity for carbon dioxide.
  - A higher affinity for carbon monoxide.
  - A lower affinity for carbon dioxide.

41. Which of the following is not a characteristic of white blood cells:
- Absence of hemoglobin.
  - Presence of a nucleus.
  - Most are present in the blood stream.
  - They can migrate out of the circulatory system.
  - All are characteristics of white blood cells.
42. Large molecules such as peptides and proteins move into and out of the bloodstream by way of:
- Continuous capillaries.
  - Fenestrated capillaries.
  - Thoroughfare channels.
  - Metarterioles.
  - Gap junctions.
43. Boyle's law is the basis for pulmonary ventilation and it states that:
- An increase in volume will decrease pressure and air will be sucked in.
  - An increase in volume will increase pressure and air will be sucked in.
  - A decrease in volume will increase pressure and air will be sucked in.
  - A decrease in volume will decrease pressure and air will be sucked in.
  - An increase in volume will decrease pressure and air will be forced out.
44. The total amount of air that can move in and out of your lungs in a single respiratory cycle is the:
- Tidal volume.
  - Total lung capacity.
  - Vital capacity.
  - Inspiratory capacity.
  - Expiratory reserve volume.
45. The simple squamous epithelium covering the valves as well as the inner surface of the heart constitutes the:
- epicardium.
  - endocardium.
  - myocardium.
  - Fibrous skeleton.
  - Visceral pericardium.

46. The effect of lowering pH would shift the oxygen-hemoglobin saturation curve:
- To the right as hemoglobin releases more oxygen.
  - To the left as hemoglobin releases less oxygen.
  - To the right as hemoglobin releases less oxygen.
  - To the left as hemoglobin releases more oxygen.
  - None of the above.
47. The oxygen-hemoglobin saturation curve is sigmoidal because:
- Oxygen binds heme with successively higher affinities.
  - Oxygen binds heme four at once.
  - Oxygen binds heme two at a time.
  - Oxygen binds heme irreversibly.
  - Oxygen binds to the amino groups on hemoglobin.
48. Which of the following is not a mechanism for transporting carbon dioxide?
- Bound to the heme of hemoglobin.
  - Dissolved in plasma.
  - Bound to the exposed amino groups of hemoglobin.
  - As carbonic acid.
  - They all are mechanisms for transporting carbon dioxide.
49. Which of the following is not an important property that improves the efficiency of diffusion at the respiratory membrane?
- Differences in partial pressures are substantial.
  - Distances involved in gas exchange are small.
  - Gases are lipid soluble.
  - Blood flow and air flow are coordinated.
  - The total surface area is small.
50. The alveolar epithelium is composed of:
- Stratified columnar epithelium.
  - Simple cuboidal epithelium.
  - Stratified squamous epithelium.
  - Pseudostratified ciliated columnar epithelium.
  - None of the above.