1. Lymphatic vessels recover about ______________ of the fluid filtered by capillaries.
   A. ~1%       C. ~25%
   B. ~10%      D. ~50%       E. ~85%

2. Special lymphatic vessels called lacteals absorb dietary ______________ that are not absorbed by the blood capillaries.
   A. water       C. vitamins
   B. glucose     D. amino acids
   E. lipids

3. The ______________ tonsils are the largest, and their surgical removal (tonsillectomy) used to be one of the most common surgical procedures performed in children.
   A. adenoid
   B. lingual       C. palatine
   D. pharyngeal
   E. nasopharyngeal

4. This is the only lymphatic organ with afferent lymphatic vessels.
   A. lymph node
   B. thymus
   C. spleen
   D. red bone marrow
   E. tonsils

5. Removal of the ______________ will be the most harmful of all for a one-year-old child.
   A. spleen
   B. lymph node
   C. thymus
   D. appendix
   E. palatine tonsil

6. ______________ are secreted by cells infected with viruses, alerting neighboring cells and protecting them from becoming infected.
   A. Complement system globulins
   B. Interferons
   C. Granzymes
   D. Pyrogens
   E. Perforins

7. A pyrogen is a substance that causes
   A. inflammation.
   B. opsonization.
   C. complement fixation.
   D. cytolysis.
   E. fever.

8. One characteristic of the immune response is specificity. This means that…
   A. immunity starts in defined organs in the body.
   B. immunity starts in specialized tissues in the body.
   C. immunity is carried on by a specific group of cells of the immune system.
   D. immunity is directed against a particular pathogen.
   E. immunity is carried on by a specific group of tissues of the immune system.

9. T cells achieve immunocompetence in
   A. the bone marrow.
   B. the bloodstream.
   C. the spleen.
   D. the thymus.
   E. the liver.
10. The serum used for emergency treatment of snakebites stimulates
   A. artificial passive immunity.
   B. artificial active immunity.
   C. natural passive immunity.
   D. natural active immunity.
   E. artificial specific immunity.

11. All of the following can act as antigen-presenting cells except
   A. reticular cells.
   B. dendritic cells.
   C. macrophages.
   D. B cells.
   E. T cells.

12. Memory T cells can live up to
   A. weeks.
   B. days.
   C. decades.
   D. years.
   E. months.

13. The human immunodeficiency virus (HIV) targets mainly
   A. helper T cells.
   B. B cells.
   C. plasma cells.
   D. cytotoxic T cells.
   E. natural killer cells.

14. Which of the following is NOT a function of the lymphatic system?
   A. Defending from infection caused by microorganisms and other foreign substances.
   B. Aiding in erythropoiesis of red blood cells.
   C. Maintaining fluid balance by returning excess interstitial fluid to the blood.
   D. Absorbing and transporting lipids from the digestive tract.

15. How do lymphatic capillaries differ from blood capillaries?
   A. Lymphatic capillaries do not have a basement membrane.
   B. Simple squamous epithelial cells of lymphatics overlap with loose attachments.
   C. Lymphatic capillaries are more permeable than blood capillaries.
   D. Lymphatic capillaries have one-way valves preventing movement of fluid back into interstitial spaces.
   E. All of the choices are ways lymphatic capillaries differ from blood capillaries.

16. Lymph movement is assisted by
   A. contraction of skeletal muscle.
   B. contraction of smooth muscle in lymph vessel.
   C. pressure changes in the thorax during respiration.
   D. compression of lymphatic vessels.
   E. All of these choices are correct.

17. Lymphatic tissue contains an interlaced network of reticular fibers that functions to
   A. produce lymphocytes.
   B. produce capsules around lymph nodes.
   C. attack microorganisms.
   D. line the walls of lymphatic vessels.
   E. trap microorganisms.

18. Bacteria and debris are actively removed from the lymph by _____ in the sinuses of lymph nodes.
   A. trabecular cells
   B. germinal cells
   C. macrophages.
   D. lymphocytes
   E. plasma cells
19. Germinal centers are the sites of
   A. increased blood flow to the lymph nodes.
   B. fluid production.
   C. increased flow of lymph from infected tissues.
   D. entrance of lymph into lymph nodes.
   E. proliferation of lymphocytes in the lymph nodes.

20. The only structures that filter lymph is/are the
    A. tonsils.
    B. spleen.
    C. lymph nodes.
    D. thymus.
    E. none of these

21. The spleen
   A. filters damaged red blood cells from the blood.
   B. changes undifferentiated lymphocytes into competent lymphocytes.
   C. is necessary for life. It can't be removed without causing death.
   D. produces several different hormones with unknown function.
   E. has additional digestive functions.

22. The white pulp of the spleen
   A. contains lymphocytes that can stimulate an immune response.
   B. filters lymph as it flows through the spleen.
   C. destroys defective red blood cells.
   D. stimulates immune responses, filter lymph, and destroys defective red blood cells.

23. What is the function of thymosin?
    A. destroys damaged red blood cells
    B. destroys damaged white blood cells
    C. activates lymphocytes in lymph nodes
    D. maturation of T-cells

24. When innate immunity is activated,
    A. each exposure is very specific.
    B. previous exposures are remembered.
    C. each exposure produces the same response.
    D. each exposure increases the strength of the immune response.
    E. the second exposure does not produce a response.

25. Which of the following is true of adaptive immunity?
    A. It is present at birth.
    B. Previous encounters with the foreign substance does not change the response.
    C. The second response is faster and stronger than the first response.
    D. Responses are general, not specific.

26. Which of the following would be classified as an innate physical barrier?
    A. activation of complement
    B. phagocytosis of invading organisms
    C. washing action of tears and saliva
    D. inflammation
    E. release of histamine
27. The movement of leukocytes to the source of certain chemicals is called
   A. chemotaxis.                  C. chemoreception.                 E. hemolysis.
   B. opsonization.               D. phagocytosis.

28. Lysozyme is
   A. an enzyme found in body fluids that destroys certain bacteria.
   B. a type of antibody that attracts a phagocyte.
   C. a cytokine produced by T cells.
   D. an antigen.
   E. a bacteria.

29. The two major types of phagocytic cells are
   A. neutrophils and monocytes.    C. monocytes and macrophages.     E. eosinophils and T cells.
   B. neutrophils and macrophages.  D. lymphocytes and monocytes.

30. Histamine and leukotrienes are released from
   A. basophils and mast cells.     C. neutrophils and lymphocytes.    E. phagocytes.
   B. eosinophils and basophils.    D. macrophages and microphages.

31. Which of the following is usually the first cell type to leave the blood and enter infected tissues?
   A. eosinophil                   C. monocyte                      E. neutrophil
   B. lymphocyte                  D. natural killer cell

32. Natural Killer (NK) cells
   A. a type of macrophage.
   B. are a type of plasma cell.
   C. secrete enzymes that kill tumor or virus-infected cells.
   D. are derived from B cells.
   E. promote inflammation.

33. The redness and heat seen in an inflamed area are the result of
   A. vasoconstriction.
   B. increased blood flow to the area.
   C. phagocyte mobilization.
   D. production of interferon.
   E. a reddish substance released by erythrocytes.

34. Adaptive immunity is stimulated by
   B. histamines.                 D. complement.

35. _____ are part of cell-mediated immunity while _____ are part of antibody-mediated immunity.
   A. B cells, NK cells            C. T cells, B cells               E. Neutrophils, monocytes
   B. Antibodies, antigens         D. Macrophages, antibodies

36. Narcolepsy might be due to the autoimmune effects caused by…
   A. a genetic variant producing cell markers similar antigens on H1N1.
   B. exposure to the H1N1 virus.
   C. destruction of cells responsible for secreting orexin (hypocretin).
   D. all of the above.
   E. none of these.
37. The process of eliminating those lymphocytes that react or respond against self-antigens is called
   A. phagocytosis.
   B. inflammation.
   C. negative selection.
   D. activation of complement.
   E. natural selection.

38. Different T-cell receptors can respond to different antigens because of different…
   A. variable regions in the structure of the receptors.
   B. epitopes in the receptor's structure.
   C. selection processes.
   D. complement binding sites in the receptors.
   E. antigenic determinants.

39. The MHC class I antigen complex displays a foreign antigen on the cell surface. This prompts the immune
    system to destroy
   A. B cell clones.
   B. extracellular antigens.
   C. the displaying cell.
   D. mature red blood cells.
   E. the virus inside the cell, but not the cell.

40. MHC class II molecules are found on
   A. neutrophils, monocytes, and macrophages.
   B. dendritic cells, B cells, and helper T cells.
   C. monocytes, helper T cells, and neutrophils.
   D. B cells, macrophages, and dendritic cells.
   E. B cells, C cells and D cells.

41. Antibodies are produced by
   A. cytotoxic T cells stimulated by helper T cells.
   B. helper T cells stimulated by various cytokines.
   C. B cells that differentiate to form plasma cells.
   D. natural killer cells as they lyse cancer cells.
   E. the red bone marrow.

42. Antibodies
   A. play a large role in cell-mediated immunity.
   B. are produced by both T and B cells.
   C. are composed of four light and four heavy polypeptide chains.
   D. are not specific, but act generally.
   E. have a variable region that binds to a specific antigenic determinant.

43. The secondary or memory response
   A. occurs after the primary response has activated NK cells.
   B. provides better protection than the primary response.
   C. is less effective in antibody production.
   D. produces different antibodies than those produced in the primary immune response.
   E. does not protect the body after the first exposure.
44. Which is the proper order of events in cell-mediated immunity?
   (1) cloning of cytotoxic T cells and memory T cells
   (2) antigen presented to T lymphocyte
   (3) activation of T lymphocytes
   (4) cytotoxic T cells attack target cells
   A. 2, 3, 4, 1
   B. 1, 4, 2, 3
   C. 2, 3, 1, 4
   D. 3, 2, 4, 1
   E. 1, 2, 3, 4,

45. Several research groups are working on vaccines that will be effective against the AIDS virus. When a successful vaccine is produced, it is likely to be injected to produce
   A. active natural immunity.
   B. active artificial immunity.
   C. passive natural immunity.
   D. passive artificial immunity.
   E. active passive immunity.

46. Edema is
   A. cancer of lymphoid tissue.
   B. swelling of lymph nodes due to infection.
   C. swelling due to excess tissue fluid.
   D. infection of a lymphatic vessel.

47. Which of the following is NOT a tonsil?
   A. pharyngeal
   B. lingual
   C. oral
   D. palatine
   E. all of them are tonsils

48. Peyer's patches are lymphatic nodules found in the
   A. intestine.
   B. throat.
   C. stomach.
   D. liver.
   E. none of these

49. Which of the following is NOT a nonspecific defense mechanism?
   A. barriers to entry
   B. antibodies
   C. inflammation
   D. phagocytosis
   E. all of these are nonspecific

50. ______, released by damaged tissue and mast cells, causes capillaries to dilate and become more permeable.
   A. Fibrinogen
   B. Serotonin
   C. Lysozyme
   D. Complement
   E. Histamine

51. What occurs because of increased capillary permeability at the site of inflammation?
   A. escaped fluids cause swelling
   B. increased pressure from fluid causes pain
   C. clotting factors move into tissues
   D. all apply
   E. none of these
52. Complement…
   A. is a series of blood plasma proteins.
   B. attracts phagocytes.
   C. causes bacteria cells to burst.
   D. all of these
   E. none of these

53. T cells and B cells are
   A. antigens.
   B. megakaryocytes.
   C. macrophages.
   D. neutrophils.
   E. none of these

54. Under the influence of cytokines from helper T cells, B cells enlarge and divide, forming
   A. plasma cells.
   B. memory cells.
   C. helper cells.
   D. plasma cells and memory cells.

55. Which of the following is NOT an action of antibodies with the antigen?
   A. neutralize bacterial toxins by coating them
   B. make a cluster of antigen-antibody complexes
   C. make the antigen more susceptible to phagocytosis
   D. all apply.

56. Cytotoxic T cells may attack
   A. antigen-bearing cells.
   B. cancer cells.
   C. virus infected cells.
   D. all of these.
   E. none of these

57. As a child, you had the chicken pox. You are exposed to chicken pox several years later, but you do not get them again. What kind of immunity do you have?
   A. natural active
   B. artificial active
   C. natural passive
   D. artificial passive
   E. all of these

58. A mother who had the measles as a child, has a baby. At the age of 1 month, the baby is exposed to measles but does not get sick. What kind of immunity does she have?
   A. natural active
   B. artificial active
   C. natural passive
   D. artificial passive
   E. none of these

59. An immediate wide-spread (not localized) allergic response similar to that shown by “Hitch” to the seafood he ate is called…
   A. delayed allergic response.
   B. IgE-mediated allergic response.
   C. anaphylactic shock.
   D. primary allergic response.

60. Which of the following is NOT true about anaphylactic shock?
   A. There is a sudden and life-threatening rise in blood pressure.
   B. There is a sudden and life-threatening drop in blood pressure.
   C. Histamine has increased the permeability of capillaries.
   D. Epinephrine can delay the body's adverse response.