Multiple-Choice Questions

1) The lymphoid system is composed of
   A) lymphatic vessels.
   B) lymph nodes.
   C) the spleen.
   D) A and B only
   E) all of the above
   Answer: E
   Diff: 1
   Learning Outcome: 14.1
   Skill Level: 1 Reviewing Facts and Terms

2) A foreign invader that may cause disease is called a(n)
   A) pathogen.
   B) antigen.
   C) antibody.
   D) virus.
   E) bacteria.
   Answer: A
   Diff: 1
   Learning Outcome: 14.1
   Skill Level: 1 Reviewing Facts and Terms

3) The primary function of the lymphoid system is
   A) circulation of nutrients.
   B) transport of hormones.
   C) production, maintenance, and distribution of lymphocytes.
   D) production, maintenance, and distribution of plasma proteins.
   E) all of the above
   Answer: C
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms
4) The two collecting ducts that drain the lymphatic trunks are the
A) thoracic duct and right lymphatic duct.
B) lumbar duct and left lymphatic duct.
C) intestinal duct and left intercostal duct.
D) bronchomediastinal duct and subclavian duct.
E) none of the above
Answer: A
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

5) Flow through lymph vessels resembles flow through
A) elastic arteries.
B) arterioles.
C) the vena cava.
D) veins.
E) muscular arteries.
Answer: D
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

6) Lymph returns to the venous circulation by way of draining into the
A) right lymphatic duct.
B) subclavian veins.
C) inferior vena cava.
D) superior vena cava.
E) dural sinus.
Answer: B
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

7) The formation of lymph would increase if there were a(n)
A) increase in blood osmotic pressure.
B) increase in tissue osmotic pressure.
C) decrease in the volume of tissue fluid.
D) decrease in protein in the tissue fluid.
E) all of the above
Answer: B
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms
8) Lymph nodes
A) produce antibodies from specialized T cells.
B) monitor the contents of lymph by removing debris and pathogens.
C) act as a "check station" for cancer cells.
D) B and C only
E) all of the above
Answer: D
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

9) In general, lymphocytes
A) spend little time in the blood.
B) have a relatively long life span.
C) are not evenly distributed in the lymphoid tissues.
D) B and C only
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

10) The region of a lymph node through which blood vessels enter and exit is called the
A) sinus.
B) medulla.
C) hilum.
D) nodule.
E) capsule.
Answer: C
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

11) ________ are large lymphoid nodules that are located in the walls of the pharynx.
A) Tonsils
B) Peyer's patches
C) Lymph nodes
D) Complements
E) Spleens
Answer: A
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms
12) The lymph nodes of the axillary region receive lymph mainly from the
A) Peyer's patches.
B) scalp and face.
C) arm and mammary glands.
D) thoracic viscera.
E) abdominal viscera.
Answer: C
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

13) The white pulp of the spleen contains large numbers of
A) red blood cells.
B) macrophages.
C) eosinophils.
D) basophils.
E) antibodies.
Answer: B
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

14) Lymphoid organs are different from lymphoid tissues in that lymphoid organs
A) contain lymphocytes and lymphoid tissues do not.
B) are found in the digestive tract and lymphoid tissues are found in the thorax.
C) are separated from surrounding tissues by a fibrous capsule and lymphoid tissues are not.
D) A and C only
E) all of the above
Answer: C
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

15) The spleen
A) is the largest lymphoid organ.
B) contains nodules similar to other lymphoid nodules.
C) contains lymphocytes.
D) is located in the left upper quadrant.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms
16) The red pulp of the spleen is a storage site for
   A) lymphocytes.
   B) neutrophils.
   C) red blood cells.
   D) platelets.
   E) fibrous connective tissue.
   Answer: C
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms

17) Stem cells that will form T cells are modified in the
   A) bone marrow.
   B) liver.
   C) spleen.
   D) thymus.
   E) kidneys.
   Answer: D
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms

18) Lymph differs from plasma in that
   A) lymph contains more protein than plasma.
   B) lymph contains white blood cells, whereas plasma does not.
   C) plasma contains more protein than plasma.
   D) lymph contains electrolytes, and plasma does not.
   E) None of the above, lymph and plasma are the same.
   Answer: C
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms

19) Lymphatic vessels that exit the lymph node are called
   A) lacteals.
   B) afferent lymphatic vessels.
   C) efferent lymphatic vessels.
   D) lymphatic trunks.
   E) lymphatic ducts.
   Answer: C
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms
20) Lymph reenters the venous system at the
A) right and left subclavian veins.
B) lymph nodes.
C) thoracic duct.
D) intestinal tract.
E) vena cava.
Answer: A
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

21) Lymph nodules are composed of loose connective tissue containing densely packed
A) Peyer's patches.
B) basophils.
C) spleens.
D) neutrophils.
E) lymphocytes.
Answer: E
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

22) A bacterial infection in the foot would most likely affect lymph nodes in which of the following
regions?
A) axillary
B) cervical
C) mammary
D) inguinal
E) brachial
Answer: D
Diff: 1
Learning Outcome: 14.2
Skill Level: 2 Reviewing Concepts

23) The role of the spleen is slightly different than other lymph organs because it also
A) produces antibodies.
B) produces memory cells.
C) filters blood.
D) filters lymph.
E) contains lymphocytes.
Answer: C
Diff: 1
Learning Outcome: 14.2
Skill Level: 2 Reviewing Concepts
24) The thymus gland is positioned
A) posterior to the thyroid gland.
B) just behind the sternum.
C) inferior to the heart.
D) posterior to the trachea.
E) in the inguinal region.
Answer: B
Diff: 1
Learning Outcome: 14.2
Skill Level: 1 Reviewing Facts and Terms

25) Major events associated with inflammation include
A) redness, swelling, heat, and pain.
B) redness, pus, fever, and rapid heart rate.
C) tears, swelling, pain, and fever.
D) swelling, redness, tissue damage, and altered pH.
E) heat, pain, fever, and activation of the complement system.
Answer: A
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

26) The body’s nonspecific defenses include
A) skin.
B) complement.
C) interferon.
D) inflammation.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

27) Special lymphocytes that are part of the nonspecific defenses are called
A) memory T cells
B) memory B cells
C) NK cells
D) plasma cells
E) monocytes
Answer: C
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms
28) Interferons may be described as
A) products of activated lymphocytes and macrophages.
B) antiviral substances.
C) an example of cytokines.
D) coordinators of local defense activities.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

29) The most active phagocytic cells found in circulating blood are
A) neutrophils and monocytes.
B) eosinophils and basophils.
C) lymphocytes and monocytes.
D) neutrophils and basophils.
E) none of the above
Answer: A
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

30) Virus-infected cells release
A) complement.
B) immunity.
C) interferon.
D) immunological surveillance.
E) fever.
Answer: C
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

31) The first line of cellular defense against pathogens is
A) T cells.
B) B cells.
C) NK cells.
D) phagocytes.
E) plasma cells.
Answer: D
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms
32) Which of the following contains visible granules in its cytoplasm?
A) microglia
B) monocytes
C) neutrophils
D) lymphocytes
E) all of the above
Answer: C
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

33) The least numerous leukocytes are
A) lymphocytes.
B) monocytes.
C) neutrophils.
D) basophils.
E) eosinophils.
Answer: D
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

34) Which of the following is the LAST step in inflammation?
A) red blood cells release pus-forming agents.
B) T cells release interferon.
C) mast cells release histamine, serotonin, and heparin.
D) phagocytosis.
E) blood flow to an area increases.
Answer: D
Diff: 1
Learning Outcome: 14.3
Skill Level: 1 Reviewing Facts and Terms

35) The cells primarily responsible for immunity are
A) lymphocytes and macrophages.
B) neutrophils and macrophages.
C) monocytes and macrophages.
D) eosinophils and lymphocytes.
E) basophils and monocytes.
Answer: A
Diff: 1
Learning Outcome: 14.4
Skill Level: 1 Reviewing Facts and Terms
36) Which of the following is a specific body defense?
A) hair  
B) epithelium  
C) secretions  
D) immunity  
E) basement membranes  
Answer: D  
Diff: 1  
Learning Outcome: 14.4  
Skill Level: 1 Reviewing Facts and Terms

37) Immunity that results from antibodies ingested from breastmilk is which type of immunity?
A) active natural  
B) passive natural  
C) innate  
D) active artificial  
E) autoimmunity  
Answer: B  
Diff: 1  
Learning Outcome: 14.4  
Skill Level: 1 Reviewing Facts and Terms

38) In active artificial immunity,
A) the immune system attacks normal body cells.  
B) the body makes a memory of the attack.  
C) the body receives antibodies produced by another person.  
D) the body receives antibodies produced by another animal.  
E) genes for antibodies are introduced into the body.  
Answer: B  
Diff: 1  
Learning Outcome: 14.4  
Skill Level: 1 Reviewing Facts and Terms

39) Which of the following secretes antibodies?
A) NK cells  
B) plasma cells  
C) helper T cells  
D) cytotoxic T cells  
E) suppressor T cells  
Answer: B  
Diff: 1  
Learning Outcome: 14.4  
Skill Level: 1 Reviewing Facts and Terms
40) The cells responsible for humoral immunity are the
A) NK cells.
B) B cells.
C) helper T cells.
D) cytotoxic T cells.
E) suppressor T cells.
Answer: B
Diff: 1
Learning Outcome: 14.4
Skill Level: 1 Reviewing Facts and Terms

41) The cells that are actively involved in immunological surveillance are the
A) NK cells.
B) plasma cells.
C) B cells.
D) helper T cells.
E) suppressor T cells.
Answer: A
Diff: 1
Learning Outcome: 14.4
Skill Level: 1 Reviewing Facts and Terms

42) Newborn infants gain most of their immunity from
A) early immunizations.
B) contact with viruses and bacteria.
C) antibodies passed from the mother across the placenta.
D) contact with siblings.
E) innate factors.
Answer: C
Diff: 1
Learning Outcome: 14.4
Skill Level: 1 Reviewing Facts and Terms

43) Humoral immunity is the responsibility of the
A) cytotoxic T cells.
B) helper T cells.
C) suppressor T cells.
D) B cells.
E) plasma cells.
Answer: D
Diff: 1
Learning Outcome: 14.4
Skill Level: 1 Reviewing Facts and Terms
44) In an experimental situation, a virus is injected into a rabbit and the rabbit is allowed to make antibodies for the viral antigen. These antibodies are then removed from the rabbit plasma and injected into a human to help deal with the same viral disease. This would be an example of 
A) innate immunity.
B) active immunization.
C) passive immunization.
D) natural immunity.
E) autoimmunity.
Answer: B
Diff: 1
Learning Outcome: 14.4
Skill Level: 2 Reviewing Concepts

45) Blocking the antigen receptors on the surface of lymphocytes would interfere with 
A) phagocytosis of the antigen.
B) that lymphocyte’s ability to produce antibodies.
C) antigen recognition.
D) the ability of the lymphocyte to present antigen.
E) agglutination of the antigen.
Answer: C
Diff: 2
Learning Outcome: 14.4
Skill Level: 2 Reviewing Concepts

46) T cells are responsible for 
A) programming macrophages.
B) humoral immunity.
C) producing antibodies.
D) cellular immunity.
E) autoimmunity.
Answer: D
Diff: 1
Learning Outcome: 14.5
Skill Level: 1 Reviewing Facts and Terms

47) The major histocompatibility complex (MHC) 
A) is responsible for forming lymphocytes.
B) produces antibodies in lymph glands.
C) is a group of genes that codes for human leukocyte antigens.
D) is a membrane protein that can recognize foreign antigens.
E) is the antigen found on bacteria that stimulates an immune response.
Answer: D
Diff: 1
Learning Outcome: 14.5
Skill Level: 1 Reviewing Facts and Terms
48) Cytotoxic T cells destroy their target cells by releasing substances that alter
A) protein production.
B) ribosomes.
C) DNA.
D) cell membranes.
E) all of the above
Answer: D
Diff: 1
Learning Outcome: 14.5
Skill Level: 1 Reviewing Facts and Terms

49) Cells that help to regulate the immune response are
A) B cells.
B) plasma cells.
C) helper T cells.
D) cytotoxic cells.
E) NK cells.
Answer: C
Diff: 1
Learning Outcome: 14.5
Skill Level: 1 Reviewing Facts and Terms

50) In order for a lymphocyte to respond to an antigen, the antigen must
A) be phagocytized by the lymphocyte.
B) enter the cytoplasm of the lymphocyte.
C) bind to the DNA of the lymphocyte.
D) bind to specific receptors on the lymphocyte membrane.
E) depolarize the lymphocyte membrane.
Answer: D
Diff: 1
Learning Outcome: 14.5
Skill Level: 2 Reviewing Concepts

51) Immunoglobulins that are the largest class and are mainly responsible for resistance against viruses, bacteria, and bacterial toxins are
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: D
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms
52) Immunoglobulins that attach to mast cells and basophils and are involved in allergic reactions are
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: C
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

53) The immunoglobulins that can cross the placenta are the
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: D
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

54) Immunoglobulins that are the first antibodies to be produced in response to infection are
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: E
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

55) Immunoglobulins that are primarily found in glandular secretions are
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: A
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms
56) The binding of an antigen to an antibody can result in
A) neutralization of the antigen.
B) agglutination or precipitation.
C) complement activation.
D) destruction of the antigen.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.6
Skill Level: 2 Reviewing Concepts

57) B cells are primarily activated by the activities of
A) antigens.
B) antibodies.
C) helper T cells.
D) macrophages.
E) plasma cells.
Answer: C
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

58) Antibodies cause which of the following reactions?
A) agglutination
B) precipitation
C) neutralization
D) opsonization
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

59) The largest class of antibodies, with several subtypes, is
A) IgA.
B) IgD.
C) IgE.
D) IgG.
E) IgM.
Answer: D
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms
60) This immunoglobulin is responsible for defense against many viruses, bacteria, and bacterial toxins.
A) IgA  
B) IgD  
C) IgE  
D) IgG  
E) IgM  
Answer: D  
Diff: 1  
Learning Outcome: 14.6  
Skill Level: 1 Reviewing Facts and Terms

61) This immunoglobulin functions to attack bacteria insensitive to IgG.
A) IgA  
B) IgD  
C) IgE  
D) IgF  
E) IgM  
Answer: E  
Diff: 1  
Learning Outcome: 14.6  
Skill Level: 1 Reviewing Facts and Terms

62) The function of this immunoglobulin is to attack pathogens before they enter body tissues.
A) IgA  
B) IgD  
C) IgE  
D) IgF  
E) IgM  
Answer: A  
Diff: 1  
Learning Outcome: 14.6  
Skill Level: 1 Reviewing Facts and Terms

63) The chemical mediators responsible for killing tumor cells, stimulating T cell activity, and inhibiting parasites and viruses are termed
A) interleukins.  
B) interferons.  
C) tumor necrosis factors.  
D) phagocytic regulators.  
E) colony-stimulating factors.  
Answer: C  
Diff: 1  
Learning Outcome: 14.6  
Skill Level: 1 Reviewing Facts and Terms
64) This class of chemical mediators stimulates the production of both microphages and monocytes.
   A) IL-1
   B) IL-2
   C) MIF
   D) M-CSF
   E) GM-CSF
   Answer: E
   Learning Outcome: 14.6
   Skill Level: 1 Reviewing Facts and Terms

65) Unnecessary immune responses to haptens are
   A) immunodeficiency diseases.
   B) characteristics of AIDS.
   C) allergies.
   D) characteristics of HIV infection.
   E) common in the elderly.
   Answer: C
   Learning Outcome: 14.7
   Skill Level: 1 Reviewing Facts and Terms

66) The human immunodeficiency virus (HIV) that causes the disease known as AIDS selectively infects
   A) B cells.
   B) plasma cells.
   C) cytotoxic T cells.
   D) helper T cells.
   E) suppressor T cells.
   Answer: D
   Learning Outcome: 14.7
   Skill Level: 3 Critical Thinking & Clinical Applications

67) Infection with the HIV virus occurs through
   A) eating contaminated food.
   B) airborne droplets from coughs and sneezes.
   C) intimate contact with an infected person's body fluids.
   D) casual contact with an infected individual.
   E) all of the above
   Answer: C
   Learning Outcome: 14.7
   Skill Level: 3 Critical Thinking & Clinical Applications
68) Which of the following is an autoimmune disease?
A) Graves' disease
B) rheumatoid arthritis
C) pernicious anemia
D) Type 1 diabetes mellitus
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 14.7
Skill Level: 3 Critical Thinking & Clinical Applications

69) One of the most common cancers seen in AIDS patients is
A) small-cell carcinoma.
B) Kaposi's sarcoma.
C) malignant neoplasm.
D) lung cancer.
E) bone cancer.
Answer: B
Diff: 1
Learning Outcome: 14.7
Skill Level: 3 Critical Thinking & Clinical Applications

70) Changes in the immune system that accompany aging include
A) T cells becoming less responsive to antigens.
B) more cytotoxic T cells responding to infections.
C) increased numbers of T helper cells.
D) higher levels of antibodies after initial exposure to antigens.
E) all of the above
Answer: A
Diff: 1
Learning Outcome: 14.8
Skill Level: 1 Reviewing Facts and Terms

71) With advancing age, the immune system
A) becomes more effective at combating disease.
B) remains the same and is not affected by the aging process.
C) has alternating periods of efficacy.
D) becomes less effective at combating disease.
E) becomes more responsive to antigens.
Answer: D
Diff: 1
Learning Outcome: 14.8
Skill Level: 1 Reviewing Facts and Terms
72) The increased incidence of cancer in the elderly reflects the fact that
A) immune surveillance increases.
B) tumor cells are eliminated effectively.
C) their diets do not meet nutritional standards.
D) everyone is prone to disease.
E) immune surveillance declines with age.
Answer: E
Diff: 1
Learning Outcome: 14.8
Skill Level: 1 Reviewing Facts and Terms

Matching Questions

1) Match the type of immunity with its description.

_____ 1. specific resistance (immunity) A. produced by antibodies that develop in response to antigens (immune response)
_____ 2. acquired immunity B. produced by prior exposure of antibody production
_____ 3. innate immunity C. develops after exposure to antigens in environment
_____ 4. passive immunity D. conferred by administration of antibodies to combat infection
_____ 5. active immunity E. develops after administration of antigen to prevent disease
_____ 6. induced active immunity F. responds to threats on an individual basis
_____ 7. natural passive immunity G. conferred by transfer of maternal antibodies across placenta or in breast milk
_____ 8. induced passive immunity H. genetically determined—no prior exposure or antibody production involved
_____ 9. naturally acquired immunity I. no memory
Answer: 1-F, 2-B, 3-H, 4-I, 5-A, 6-E, 7-G, 8-D, 9-C
Diff: 1
Learning Outcome: 14.4
Skill Level: 2 Reviewing Concepts
Fill in the Blank Questions

1) Lymph is ______________________ that has entered a lymphatic capillary.
   Answer: tissue fluid
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms

2) _________________________ is the condition caused by an accumulation of tissue fluid in the interstitial spaces.
   Answer: Edema
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 3 Critical Thinking & Clinical Applications

3) ________________ are masses of lymphoid tissue located in the pharynx.
   Answer: Tonsils
   Diff: 1
   Learning Outcome: 14.2
   Skill Level: 1 Reviewing Facts and Terms

4) _________________________ are phagocytic cells that are permanent residents of specific tissues and organs.
   Answer: Fixed macrophages
   Diff: 1
   Learning Outcome: 14.3
   Skill Level: 1 Reviewing Facts and Terms

5) The ability of certain phagocytes to move through the wall of a capillary is called ____________________.
   Answer: diapedesis
   Diff: 1
   Learning Outcome: 14.3
   Skill Level: 1 Reviewing Facts and Terms

6) The ability of certain cells to respond to changes in their chemical environment is called ________________.
   Answer: chemotaxis
   Diff: 1
   Learning Outcome: 14.3
   Skill Level: 1 Reviewing Facts and Terms

7) Any compound that can stimulate the body to produce antibodies is called a(n) ____________________.
   Answer: antigen
   Diff: 1
   Learning Outcome: 14.3
   Skill Level: 1 Reviewing Facts and Terms
8) Foreign substances that trigger an immune response are called _______________________.
   Answer: antigens
   Diff: 1
   Learning Outcome: 14.4
   Skill Level: 1 Reviewing Facts and Terms

9) When a population of lymphocytes are made to attack the same antigen, they are said to be _________________.
   Answer: clones
   Diff: 1
   Learning Outcome: 14.4
   Skill Level: 1 Reviewing Facts and Terms

10) ________________________ cells enable the immune system to respond more quickly if the same antigen is encountered a second time.
    Answer: Memory
    Diff: 1
    Learning Outcome: 14.4
    Skill Level: 1 Reviewing Facts and Terms

11) ________________________ exists when the immune system does not respond to a particular antigen.
    Answer: Tolerance
    Diff: 1
    Learning Outcome: 14.4
    Skill Level: 1 Reviewing Facts and Terms

12) ________________________ attracts monocytes and activates them to macrophages.
    Answer: Monocyte-chemotactic factor (MCF)
    Diff: 1
    Learning Outcome: 14.6
    Skill Level: 1 Reviewing Facts and Terms

13) ________________________ are antibodies found in body fluids.
    Answer: Immunoglobulins
    Diff: 1
    Learning Outcome: 14.6
    Skill Level: 1 Reviewing Facts and Terms

14) The portions of an antigen that are recognized by an antibody are the ________________________.
    Answer: antigens–determinant sites
    Diff: 1
    Learning Outcome: 14.6
    Skill Level: 1 Reviewing Facts and Terms
15) When an antibody binds to its proper antigen, a(n) _________________________ is formed.
Answer: antigen–antibody complex
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

16) _________________________ is the ability to demonstrate an immune response upon exposure to an antigen.
Answer: Immunological competence
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

17) _________________________ disorders develop when the immune response mistakenly targets normal body cells.
Answer: Autoimmune
Diff: 1
Learning Outcome: 14.7
Skill Level: 1 Reviewing Facts and Terms

18) Antigens that trigger allergic reactions are called _________________________.
Answer: allergens
Diff: 1
Learning Outcome: 14.7
Skill Level: 1 Reviewing Facts and Terms

Essay Questions

1) Paula's grandfather is diagnosed with lung cancer. His physician orders biopsies of several lymph nodes from neighboring regions of the body, and Paula wonders why, since his cancer is in the lungs. What would you tell her?
Answer: A key characteristic of cancer cells is their ability to break free from a tumor and migrate to other tissues of the body, forming new tumors. This process is called metastasis. The primary route for the spread of cancer cells is the lymphoid system, and cancer cells may remain in a lymph node for a period of time before moving on to other tissues. Examination of regional lymph nodes for the presence of cancer cells can help the physician determine if the cancer was caught in an early stage or whether it has started to spread to other tissues. It can also give the physician an idea of what other tissues may be affected by the cancer, which would help in deciding on the proper treatment.
Diff: 1
Learning Outcome: 14.2
Skill Level: 3 Critical Thinking & Clinical Applications
2) Willy is allergic to ragweed pollen and tells you that he read about a medication that can help his condition by blocking certain antibodies. Do you think that this treatment could help Willy? Explain.

Answer: Allergies occur when antigens called allergens bind to specific IgE-type antibodies that are bound to the surface of mast cells and basophils. A person becomes allergic when he/she develops IgE antibodies for a specific allergen. Theoretically at least, a molecule that would bind to the specific IgE for ragweed allergen and prevent the allergen from binding should help to relieve the allergy.

Diff: 1
Learning Outcome: 14.7
Skill Level: 3 Critical Thinking & Clinical Applications

3) Mr. Johnson is a 60-year-old man with severe kidney disease. His kidney disease has caused hypoproteinemia due to the filtration of, and subsequent loss of, protein in the urine. Mr. Johnson also has swollen arms and legs. Is it possible that the swollen limbs are linked to his kidney disease?

Answer: It is possible that the lymph vessels are not able to adequately handle the increased lymph flow that results from hypoproteinemia. Hypoproteinemia would cause a decrease in osmotic pressure in the blood and an increase in net filtration in the body's capillaries. This would in turn overload lymph flow, causing a buildup of lymph and leakage into the interstitial spaces, thereby creating lymphedema.

Diff: 2
Learning Outcome: 14.9
Skill Level: 3 Critical Thinking & Clinical Applications
Labeling Exercises

Using the figure above, identify the labeled part.

1) Label A: ________  
   Answer: Antigen binding sites  
   Diff: 1  
   Learning Outcome:  14.6  
   Skill Level:  1 Reviewing Facts and Terms

2) Label B: ________  
   Answer: Variable segment  
   Diff: 1  
   Learning Outcome:  14.6  
   Skill Level:  1 Reviewing Facts and Terms

3) Label C: ________  
   Answer: Constant segments of light and heavy chains  
   Diff: 1  
   Learning Outcome:  14.6  
   Skill Level:  1 Reviewing Facts and Terms

4) Label D: ________  
   Answer: Heavy chains  
   Diff: 1  
   Learning Outcome:  14.6  
   Skill Level:  1 Reviewing Facts and Terms
5) Label E: ________
Answer: Disulfide bond
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

6) Label F: ________
Answer: Antigen binding site
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

7) Label G: ________
Answer: Light chain
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

8) Label H: ________
Answer: Complement binding site
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

9) Label I: ________
Answer: Site of binding to macrophages
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

10) Label J: ________
Answer: Antigenic determinant sites
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms

11) Label K: ________
Answer: Antibodies
Diff: 1
Learning Outcome: 14.6
Skill Level: 1 Reviewing Facts and Terms