**BSC 182**

**Exam Three**

Reminder: There is **one correct answer for each question**. All questions are weighted equally. Please keep your exam and Op-scan as covered as possible.

1. Which of the following is **true** for lymphatic capillaries?
2. lymphatic capillaries dump directly into the right collecting duct
3. lymphatic capillaries are found in bones, marrow, and the central nervous system
4. the lymphatic are more permeable than circulatory capillaries
5. a high interstitial tissue pressure will draw fluid out of the lymphatic capillaries
6. lymphatic capillaries are not found in the extremities
7. This collecting duct is the larger and longer of the two. It begins around the level of the second lumbar vertebra. It drains lymph from the cysterna chili.
8. Thoracic Duct
9. Left Lymphatic Duct
10. Azygous Duct
11. Right Lymphatic Duct
12. Rubber Duct
13. **Skeletal muscle contraction** aids in lymph movement by
14. decreasing abdominal pressure and increasing thoracic pressure
15. Causing a decrease in interstitial pressure
16. resulting in the release of epinephrine which results in lympho-constriction
17. causing pressure to be placed on the lymph vessels, squeezing lymph from one valved section to the next.
18. increasing heart rate
19. **Germinal Centers,** whether in diffuse lymphoid tissue or in a lymph node will have which feature?
20. erythrocytes
21. dividing B cells
22. Thymosins
23. eosinophils
24. activated NK cells
25. The thymus
26. is a rigid structure located near the spleen
27. loses immune function as we age
28. educates the lymphocytes that will become B cells
29. is the location where the neutrophils are formed
30. produces hormones associated with lipid metabolism
31. Which is the largest **lymphatic** organ?
32. liver
33. skin
34. thymus
35. spleen
36. lymph node
37. Which antibody composes 80% of the immunoglobulins in circulation?
38. IgD
39. IgG
40. IgM
41. IgE
42. IgA
43. Which **two** types of white blood cells are going to be most often found in lymph nodes? (Identify the correctly numbered responses and find them in the five lettered options below.

1. Eosinophil

2. Basophil

3. Macrophage

4. Lymphocyte

5. Erythrocyte

1. 3 & 5
2. 2 & 4
3. 3 & 4
4. 1 & 2
5. 4 & 5
6. The red pulp of the spleen contains
7. Red blood cells only
8. Monocytes
9. Eosinophils
10. Macrophages and red blood cells
11. Dendritic cells
12. With regards to a lymph node, there will be
13. Many afferent lymph vessels; one (or two) efferent lymph vessels
14. Many afferent lymph vessels; no efferent lymph vessels
15. One afferent lymph vessel; many efferent lymph vessels
16. Many afferent lymph vessels; many efferent lymph vessels
17. One afferent lymph vessel; one efferent lymph vessel
18. Which of the following is a non-specific (innate) defense?
19. fever
20. enzyme action
21. phagocytosis
22. interferon
23. all of the above
24. Which of the following is true of fever? (Identify the correctly numbered responses and find them in the five lettered options below.
25. iron becomes more abundant
26. iron becomes sequestered
27. zinc becomes more abundant
28. phagocytic cells increase their activity
29. phagocytic cells decrease their activity

a. 1, 3, & 5

b. 2 & 4

c. 1 & 3

d. 2,3, & 5

e. 4

1. A hapten
2. stimulates the innate defenses only
3. causes a strong autoimmune response
4. is an incomplete antigen
5. stimulates the Regulator T cells
6. causes a strong immune response
7. With regards to T cells, which of the following is true? Identify the correctly numbered responses and find them in the five lettered options below.
8. Named for where they develop in the thyroid
9. Are one of the agranulocytic white blood cells
10. Compose about 80% of the monocytes
11. Can be located in white pulp of lymph node
12. Named for where they develop in the thymus

a. 1, 2, 4

b. 2, 3, 4

c. 2, 5

d. 2, 4, 5

e. 1, 3

1. Which antibody can pass through the placental barrier and provide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for a fetus?
2. IgD; humoral immunity
3. IgG; active immunity
4. IgA; passive immunity
5. IgM; active immunity
6. IgG; passive immunity
7. Inflammation results in the body responding in the following sequence to allow phagocytosis:
   1. Chemotaxis, margination, Leukocytosis, diapedesis
   2. diapedesis, Leukocytosis, chemotaxic, margination
   3. Margination, diapedesis, chemotaxis, Leukocytosis
   4. Leukocytosis, margination, diapedesis, chemotaxis
   5. Leukocytosis, margination, chemotaxis, diapedesis
8. With a **secondary** immune response, how long before antibodies **peak**?
9. From three to five years
10. Two or three days
11. Ten to fourteen days
12. More than two weeks
13. antibodies will not be released with a secondary immune response, but antigens will
14. Which of the following is true regarding **antigens**? Identify the correctly numbered responses and find them in the five lettered options below. You will indicate **only ONE letter** for a correct response.

1. all parts of an antigen are immunogenic

2. no part of an antigen is immunogenic

3. foreign antigens can stimulate lymphocytes and antibodies

4. foreign antigens must be able to interact with the lymphocytes and antibodies

5. all antigens are considered both complete and foreign.

1. 1, 3, 5
2. 2, 5
3. 4, 5
4. 1, 3
5. 3, 4
6. During a T cell’s education, if it does not attack **self**-antigens,
   1. it will be destroyed immediately
   2. it will be kept if it can recognize MHC
   3. it will be kept if it does not recognize MHC
   4. it will be destroyed if it recognizes MHC
   5. it will be destroyed if it comes in contact with an APC.
7. Which type of cell is responsible for producing and releasing antibodies?
   1. Helper T cell
   2. Plasma cells
   3. NK cells
   4. Suppressor B cell
   5. Lymphoctyes
8. Which chemicals released by the Helper T cell will stimulate the B cell to become activated and begin the cloning process
   1. lysosymes
   2. defensins
   3. cytokines
   4. perforins
   5. granzymes
9. Reed-Sternberg cells are associated with which disorder?
   1. Lymphedema
   2. Hodgkin’s Lymphoma
   3. Mononucleosis
   4. Elephantiasis
   5. Non-Hodgkin’s Lymphoma
10. Receiving a flu shot that has viral antigens or an attenuated virus is an example of
11. artificially acquired active immunity
12. artificially acquired passive immunity
13. naturally acquired active immunity
14. naturally acquired passive immunity
15. Which of the following is true with regards to memory cells?
    1. They used to be called suppressor cells
    2. are responsible for the rapid, amplified response following a second exposure
    3. Only B cells make them.
    4. Only T cells make them
    5. They are stored in the thyroid for activation
16. Where are the Peyers Patches located?
    1. At the base of the tongue
    2. In the esophageal lining
    3. In the mucosa of the small intestine.
    4. Along the mucosa of the respiratory system
    5. In the submucosa of the reproductive system
17. Which of the following is true with regards to IgD
    1. it is responsible for blood agglutination
    2. it is located on the B cell surface
    3. it activates the complement in the plasma
    4. it is found in breast milk
    5. it is found in digestive secretions
18. MHC class I proteins are found \_\_\_\_\_\_; MHC class II proteins are found \_\_\_\_\_\_\_
    1. On all B cells, on all T cells
    2. On almost all macrophages, on almost all neutrophils
    3. On almost all body cells, on immune cells
    4. On almost all mucosal cells, on all submucosal cells
    5. On APCs; on Helper T cells
19. Which **two types** of Ig formations can exist as something other than a monomer? Identify the correctly numbered responses and find them in the five lettered options below. You will indicate **only ONE letter** for a correct response.

1. IgG

2. IgA

3. IgM

4. IgE

5. IgD

1. 1, 4
2. 2, 3
3. 5
4. 3, 4
5. 2, 5
6. Neutralization is
7. something that antibodies do to viruses and bacteria to reduce their toxicity
8. something that T cells do to increase phagocytosis
9. something that antibodies do to get soluble materials to come out of solution
10. something that NK cells do to destroy an infected body cell
11. something that B cells do to go back to their resting state
12. The complement proteins, when activated by the antibodies, destroy cells by
    1. apoptosis
    2. stopping mitosis
    3. lysis
    4. granzymes
    5. excessive flattery
13. The first step of T cell activation is binding to the antigen on the APC. The second step of activation is
14. co-stimulatory signals from the antigen
15. co-stimulatory signals from the APC
16. recognition of the MHC
17. release of enzymes from the T cell
18. the destruction of the antigen on the APC
19. Interleukin 1 causes \_\_\_\_\_\_\_ while Interleukin 2 causes \_\_\_\_\_\_\_\_
    1. enzyme release, cell growth
    2. cell growth, activation of suppressor cells
    3. more receptors for IL-2 to be made, T cell division
    4. suppression of repressor cells; activation of enzymes
    5. cloning; cloning to be stopped.
20. Cytotoxic T cells attack and destroy
21. bacteria directly
22. parasitic worms
23. viruses only
24. body cells that have bacteria or viruses infecting them
25. everything with a foreign antigen
26. Mononucleosis is a great example of a cell mediated response because
27. our infected B cells attack our T cells
28. our plasma cells release antibodies against our infected B cells
29. our T cells attack our infected B cells
30. our NK cells attack our Helper T cells
31. mononucleosis does not demonstrate any kind on cell mediated responses.
32. Elephantiasis is caused by
    1. reverse transcriptase
    2. the pachydermatitis complex
    3. parenchymal reabsorption
    4. a parasitic roundworm
    5. idiopathic edema
33. Cells with the CD4 receptor will become
    1. Helper T cells
    2. Cytotoxic T cells
    3. Natural Killer Cells
    4. Plasma Cells
    5. Antigen Presenting Cells
34. How does interferon affect the surrounding cells?
    1. activates the manufacture of antiviral proteins in nearby cells
    2. causes the transformation of a Helper T cell into a Cytotoxic T cell
    3. stimulates the proliferation of plasma cells
    4. sequesters iron
    5. causes the degeneration the original viral components
35. What’s a lacteal?
36. specialized lymphatic vessel found in mammary glands
37. specialized structure in which red blood cells mingle with the lymph fluids to provide oxygen
38. the new lymphatic vessels formed in wound repair
39. lymphatic tissue specific to cancer growth
40. the location in the digestive system into which fats are absorbed
41. **Saliva and tears** contain \_\_\_\_\_\_\_\_\_\_\_ which act as a non-specific defense
42. defensins
43. granzymes
44. porins
45. complement proteins
46. lysozymes
47. Which structure is responsible for embryonic hematopoesis? (makes the RBCs in an embryo)
    1. Red bone marrow
    2. Spleen
    3. Yellow bone marrow
    4. Placenta
    5. Thymus
48. Rex has received transplanted tissue from his identical twin. What type of procedure did he have?
    1. Autograft
    2. Xenograft
    3. Allograft
    4. Isograft
    5. Stefigraft
49. The function of a regulatory T cell is to
    1. Encourage B cell proliferation
    2. Control the rate of interleukin released from APCs
    3. Manage the number of clones transitioning to plasma cells
    4. Dampen the overall immune response
    5. Stimulate glucose release into the blood stream
50. Which of the following cells can act as an Antigen Presenting Cell?

1. Natural Killer Cell

2. Mast Cell

3. Fibroblast

4. Macrophage

5. Dendritic Cell

1. 1, 3, 4
2. 2, 4, 5
3. 4
4. 4, 5
5. 1, 2
6. The four steps of an antibody’s function are listed as its “plan” of attack. Which of the following is **incorrectly** paired?
   1. P = Precipitation
   2. L = Lysis by compliment
   3. A = Activation of Granzymes
   4. N = Neutralization
   5. all of the above options are correct
7. As NK cells circulate, what signs of abnormality will they respond to?

1. Antibodies that have tagged a cell

2. Any type of foreign antigen

3. MHC II

4. body cells missing MHC I

5. cells that appear stressed and have altered markers

1. 1, 2, 4, 5
2. 2, 4, 5
3. 2, 3
4. 1, 4, 5
5. 2, 3, 4
6. With regards to the lymphatic trunks, which trunk is **not paired** (does not have left and right versions)
7. jugular
8. intestinal
9. inguinal
10. lumbar
11. subclavian
12. The **lymphatic trunks**
13. will dump lymphatic fluid into two collecting ducts
14. will dump lymphatic fluid directly into the left atrium
15. will dump lymphatic fluid into the Left Subclavian Vein
16. will dump lymphatic fluid into four collecting ducts
17. will dump lymphatic fluid directly into the right atrium
18. If a T cell is described as being “immunocompetent,” what does that mean?
19. That it has never been exposed to a pathogen
20. That it is able to recognize and bind to a specific antigen
21. It is able to immediately manufacture antibodies upon stimulation
22. It has only MHC class I receptors on its cell surface
23. It has the ability to suppress autoimmune responses.
24. Cytotoxic T cells (Tc)and NK cells use similar methods to destroy altered cells. Identify the **false** statement in the list below.
    1. Tc cells bind to cells with antigens and release destruktin
    2. Tc cells bind to cells with antigens and release granzymes
    3. Tc cells bind to cells with antigens and release perforin
    4. Tc cells bind to cells with antigens and cause apoptosis
    5. The chemicals that Tc release reacts with calcium to create pores in the cell
25. Your child (or little sister/brother) has a mild/moderate fever. From what you’ve learned in class, which steps should be taken? Even thought this was not specifically covered in the notes, apply what you’ve learned about fever and the immune response to answer the question.

1. Immediately give antibiotics to kill the bacteria

2. Wait about three days before giving antibiotics when needed

3. Never give antibiotics to children

4. Immediately reduce a mild/moderate fever

5. Give the child aspirin

6. Make the child comfortable, monitor the fever, and let it run its course

1. 1, 5
2. 2, 4
3. 3, 5
4. 5, 6
5. 2, 6

**Please double check to make sure your name and information in on your OpScan form. Double check to make sure both your name and ID are on the form. Enjoy the rest of your afternoon.**