

## ANSWER KEY-IMMUNE SYSTEM

1. Circulatory system-white blood cells  
Respiratory system-cilia and mucus that trap pathogens  
Digestive System- enzymes in stomach, pancreas, and liver destroy pathogens
2. Antigens are proteins and chemicals that are foreign to your body.
3. Antibodies are proteins made by and animal in response to a specific antigen.
4. Active immunity occurs when your body makes its own antibodies in response to an antigen.  
Passive immunity occurs when antibodies, which have been produced in another animal, are introduced into the body.
5. Lymphocytes are white blood cells throughout the lymphatic system that chemically recognize antigens. They then produce antibodies and destroy invading antigens.
6. D. All of the above
7. C. Humoral immunity
8. Passive immunity is the short-term immunity that results from the introduction of antibodies from another person or animal.
9. Cell-mediated immunity is an immune response that does not involve antibodies, but rather involves the activation of phagocytes, antigen-specific cytotoxic T-lymphocytes, and the release of various cytokines in response to an antigen.
10. Humoral immunity is mediated by macromolecules (proteins, nucleic acid) that are found in extracellular fluids such as secreted antibodies, complement proteins and certain antimicrobial peptides.
11. They are not found everywhere. They are not found in the **brain**.
12. Neck/cervical, Armpit/axillary, and the groin/inguinal areas
13. Elephantiasis is a disease caused by a parasitic worm that causes a person's body to swell up. It only occurs in people who live in the tropics, for the worm can only be found in tropical areas. The worm can be removed from the body, but the swelling doesn't reduce.

14. D. type O
15. Apoptosis is the death of cells that occurs as a normal and controlled part of an organism's growth or development.
16. The lymphatic system is the network of vessels through which lymph (fluid containing white blood cells) drains from the tissues into the blood.
17. prevention of diseases and defense against diseases
18. Blood vessels: power from heart. They are being pumped.  
Lymph vessels: triggered by movement and exercise. Not pumped.
19. Tonsils help guard and filter against inhaled microbes. The two tonsils are the palatin and lingual tonsils.
20. The spleen sends out all the unwanted waste. (largest lymph organ)
21. The thymus is where the T cells mature.
22. a. = B cells  
b. = T cells
23. monocytes- largest cell in blood, engulfs pathogens, indented nucleus  
lymphocytes- chief immune cell, large nucleus, either B or T  
neutrophil- multi-lobed, small particles circulate in cytoplasm  
basophil- lobed nucleus, involved in allergic responses  
eosinophil- involved in allergic responses, B-shaped nucleus, destroys antigen—  
antibody complexes
24. redness, swelling, increased warmth, and discomfort/pain
25. spiral (helical), Icosahedral, Complex
26. Viruses are classified based on their shape, size, symmetry, and by the groups of diseases they cause.
27. Cocci, Bacilli, Spirilla

28. A substance produced by lymphocytes, such as interferon, that acts upon other cells of the immune system, e.g., by activating macrophages.

29. Vaccination

30. Plasma cells

31. Lysozyme

32. Memory cell

33. A. pyrogens

34. A. Basophil

35. Exposure to allergen- Antibodies with histamine bind to the surface of mast cells  
Antibodies are triggered  
Histamine is released- Granules inside the mast cell release histamine as the cell bursts. Histamine causes an inflammatory response that irritates body tissues and produces the symptoms of an allergy.

36. Inflammation

37. An infection occurs when microscopic organisms gain entry into the body, survive, multiply, and disrupt normal cell function.

38. Viruses and bacteria

39.

1. Adenoids
2. Tonsils
3. Lymph nodes
4. Thymus
5. Lymphatic Vessels
6. Spleen
7. Peyer's Patch
8. Appendix
9. Bone Marrow

40. The five pathogens are bacteria, viruses, fungi, protozoa, helminthes

41. skin, mucous membranes, secretions
42. antigens
43. D. antibodies
44. A. perform apoptosis
45. False
46. B. forming pores in the membranes of target cells.
47. B. the body over-reacts to allergens
48. C. 600
49. Mast cells are specialized cells of connective tissue. They release heparin, histamine, leukotrienes, and prostaglandins to stimulate the inflammatory response.
50. ~chemical difference: lymph does not contain erythrocytes  
~lymph contains lower concentration of protein than plasma
51. ~immune system fails to develop normally (SCID-severe combined immunodeficiency disease)  
~immune response is blocked in some way (AIDS-acquired immunodeficiency syndrome)
52. swollen glands
53. C. chemotaxis
54. D. receptors
55. Phagocytosis
56. Plasma cells are large cells that produce antibodies. They are derived from B cells. Each plasma cell derived from the same B cell will manufacture millions of the identical antibodies to fight the antigen.

57. If someone is allergic to just cats, they have the IgE antibody specific to cat dander. Allergies to dogs require a separate antibody.
58. Allergens are the antigens that induce an allergic reaction. They may be medications, plants/animals, chemicals, dust or molds.
59. B. a helpful reaction to an injury
60. E. interstitial fluid
61. Antibodies → Antigens
62. C (correct)
63. True
64. True
65. True
66. True
67. True
68. False
69. True
70. True. Lymphatic capillaries are found in every tissue except avascular tissues (e.g. cartilage, epidermis, cornea, CNS, parts of the spleen, red bone marrow).
71. False
72. True
73. False-When smokers quit, immune activity begins to improve within 30 days.
74. False. HIV antibodies are ineffective in destroying the virus. Their presence is mainly an indication of the presence of HIV.

75. False. Each cell is programmed to produce one specific antibody.