1. Choose the CORRECT statement(s) concerning the function of blood.

   A. It transports oxygen and carbon dioxide.
   B. It defends the body against infection.
   C. It helps prevent loss of blood by clotting.
   D. It transports hormones.
   E. All of the choices are functions of blood.

2. The fluid that immediately surrounds tissue cells is called:

   A. lymph
   B. plasma
   C. tissue fluid
   D. cytoplasm

3. The process of cells ingesting material or "cell eating" is called:

   A. phagosomes
   B. phagocytosis
   C. pinocytosis
   D. cytolysis
   E. None of the choices are correct.

4. The inherited clotting disorder due to a deficiency in a clotting factor is:

   A. anemia
   B. leukemia
   C. carbon monoxide poisoning
   D. hemophilia
5. Which of the following continuously divide producing new cells?

A. red blood cells  
B. white blood cells  
C. stem cells  
D. heme

6. The two major components of blood are:

A. red blood cells and white blood cells  
B. plasma and serum  
C. plasma and red blood cells  
D. formed elements and plasma  
E. platelets and plasma

7. The technique for determining specific protein types that are present on RBCs is called:

A. tissue typing  
B. blood typing  
C. DNA analysis  
D. histocompatibility

8. Henry was born without the enzyme adenosine deaminase in his stem cells which give rise to white blood cells. Henry suffers from:

A. leukemia  
B. severe combined immunodeficiency disease  
C. autoimmune deficiency syndrome  
D. infectious mononucleosis

9. Choose the following circumstance(s) that must occur for hemolytic disease of the newborn.

A. the mother must be Rh−, the father Rh+, and the baby Rh+  
B. the mother must make anti-Rh antibodies  
C. breakdown of placental tissue  
D. anti-Rh antibodies must cross the placenta  
E. All of the choices must occur.
10. Hemolytic disease of the newborn occurs when:

A. the mother is Rh\(^-\), the father is Rh\(^+\), and the baby is Rh\(^-\)
B. the mother is Rh\(^+\), the father is Rh\(^+\), and the baby is Rh\(^-\)
C. the mother is Rh\(^-\), the father is Rh\(^+\), and the baby is Rh\(^+\)
D. the mother is Rh\(^+\), the father is Rh\(^-\), and the baby is Rh\(^-\)
E. None of the choices are correct.

11. The abnormal increase in immature lymphocytes is called:

A. lymphocytema
B. leukemia
C. leukopenia
D. lymphomegaly
E. None of the choices are correct.

12. Mature human red blood cells:

A. have a nucleus
B. are biconcave discs without a nucleus
C. are rare in the bloodstream
D. carry plasma

13. Choose the CORRECT statement.

A. Plasma contains fewer proteins than tissue fluid.
B. Serum is plasma plus clotting factors.
C. Cytoplasm is tissue fluid in the lymph system.
D. Plasma is serum plus clotting proteins.
E. None of the choices are correct.

14. Choose the correct statement concerning the ABO blood typing system. If your blood type is A:

A. you have anti-A antibodies
B. you have anti-B antibodies
C. you have A antigens
D. you have B antigens
E. you have anti-B antibodies and you have A antigens
15. Choose the CORRECT statement concerning the ABO blood typing system. If your blood type is B:

A. you have anti-A antibodies
B. you have anti-B antibodies
C. you have A antigens
D. you have B antigens
E. you have anti-A antibodies and you have B antigens

16. Erythrocytes are:

A. RBCs
B. WBCs
C. platelets

17. An insufficient number of red blood cells, or lack of hemoglobin result in the condition of:

A. sickle cell disease
B. hemocytosis
C. anemia
D. hemolysis
E. None of the choices are correct.

18. Which of the following are actually cell fragments and not whole cells?

A. RBCs
B. WBCs
C. platelets

19. The proteins that help regulate the production of WBCs are called:

A. leukopoietins
B. erythropoietins
C. thrombopoietins
D. colony stimulating factors

20. Rh positive red blood cells:

A. have Rh antigen
B. do not have Rh antigen
21. The most common system for typing blood is the:

A. AB system  
B. ABO system  
C. IEO system  
D. antigenic determinant system

22. Deoxyhemoglobin is:

A. hemoglobin plus oxygen  
B. hemoglobin plus carbon dioxide  
C. hemoglobin plus carbon monoxide  
D. hemoglobin without oxygen

23. Which of the following is not a characteristic of infectious mononucleosis?

A. caused by an Epstein-Barr virus  
B. symptoms include fever, sore throat and swollen lymph glands  
C. there is uncontrolled white blood cell proliferation  
D. active EBV can be passed in saliva  
E. the EBV remains within a person's body for the rest of his/her life

24. Which of these is NOT a protein found in blood?

A. albumin  
B. fibrinogen  
C. antibody  
D. keratin  
E. prothrombin

25. The combination of oxygen and hemoglobin in the lungs forms the bright red molecule:

A. myoglobin  
B. oxyhemoglobin  
C. deoxyhemoglobin  
D. hydroxyhemoglobin  
E. None of the choices are correct.
26. Platelets are also called:
   A. erythrocytes
   B. leukocytes
   C. thrombocytes
   D. hemoglobin
   E. None of the choices are correct.

27. Which of the statements is false concerning neutrophils?
   A. They are phagocytic.
   B. They are polymorphonuclear.
   C. They are made in the lymphoid tissue.
   D. They are the first to respond to infection.
   E. They are the most abundant WBC.

28. Neutrophils and lymphocytes are types of:
   A. platelets
   B. red blood cells
   C. white blood cells
   D. plasma cells
   E. epithelial cells

29. The type of agranular leukocyte that has a kidney-shaped nucleus is the:
   A. neutrophil
   B. eosinophil
   C. basophils
   D. monocyte
   E. lymphocyte

30. Blood doping involves the use of erythropoietin by athletes to:
   A. stimulate breakdown of older red blood cells
   B. add additional hemoglobin to red blood cells
   C. stimulate formation of leukocytes to boost the immune system
   D. increase the number of red blood cells
31. The plasma proteins called globulins:
   A. help transport hormone, cholesterol and iron
   B. come in alpha, beta and gamma forms
   C. contribute to plasma's osmotic pressure
   D. form blood clots
   E. help transport hormones, cholesterol and iron and come in alpha, beta and gamma forms

32. The inherited clotting disorder, where the slightest bump can cause bleeding into the joints is:
   A. thalassemia
   B. sickle cell disease
   C. hemophilia
   D. fibrinosis
   E. hemocytosis

33. The majority of carbon dioxide is transported:
   A. as \( \text{CO}_2 \) dissolved in the plasma
   B. as bicarbonate ion in the plasma
   C. by hemoglobin within red blood cells
   D. as carbonic acid within red blood cells

34. Which blood type would contain anti-B antibodies, but not anti-A antibodies?
   A. A
   B. B
   C. AB
   D. O

35. Which of the following defend the body against disease?
   A. RBCs
   B. WBCs
   C. platelets
36. The small red biconcave discs (red blood cells) are also called:

A. erythrocytes  
B. leukocytes  
C. thrombocytes  
D. hemoglobin  
E. None of the choices are correct.

37. Which of the following clotting proteins are enzymes?

A. fibrin and thromboplastin  
B. thrombin and prothrombin activator  
C. platelets and fibrin  
D. prothrombin and calcium

38. The type of leukocyte that responds to allergies is:

A. neutrophil  
B. eosinophil  
C. basophils  
D. monocyte  
E. lymphocyte

39. There are more than 12 clotting factors that participate in clot formation. Choose the factors that are in proper sequential order.

A. thromboplastin, prothrombin activator, fibrin, fibrinogen  
B. prothrombin, thrombin, prothrombin activator, fibrinogen  
C. thromboplastin, prothrombin, thrombin, fibrinogen, fibrin  
D. fibrin, fibrinogen, thrombin, prothrombin, thromboplastin activator

40. Choose the CORRECT statement.

A. RBCs squeeze through pores in capillaries.  
B. Following infection, WBCs increase.  
C. All WBCs live only 120 days.  
D. RBCs are larger than WBCs.  
E. All of the choices are correct.
41. Which of the following types of white blood cells is the largest?

A. lymphocytes  
B. monocytes  
C. neutrophils  
D. eosinophils  
E. basophils

42. Which of the following statements about hemoglobin is INCORRECT?

A. Hemoglobin contains iron.  
B. Hemoglobin has proteins associated with it.  
C. Hemoglobin will combine with oxygen.  
D. Hemoglobin will not combine with carbon dioxide.

43. Platelets:

A. phagocytize bacteria  
B. are responsible for blood type  
C. initiate clotting  
D. transport oxygen

44. Which of the following is characteristic of WBCs?

A. generally smaller than RBCs  
B. anucleate  
C. have hemoglobin  
D. not as numerous as RBCs  
E. All of the choices are correct.

45. Microscopic infectious agents, such as bacteria and viruses, which are capable of causing disease, are called:

A. virogens  
B. pathogens  
C. chemical toxins  
D. miasma
46. Choose the CORRECT statement.

A. Megakaryoblasts form platelets.
B. Erythroblasts form erythrocytes.
C. Myeloblasts form granular leukocytes.
D. Monocytes and lymphocytes are agranular.
E. All of the choices are correct.

47. When blood is transferred to a test tube and prevented from clotting, it forms two layers. They are:

A. red blood cells and white blood cells
B. plasma and serum
C. plasma and red blood cells
D. formed elements and plasma
E. platelets and plasma

48. Carl suffers from nosebleeds and gastrointestinal bleeding due to increased breakdown of platelets outside the marrow. This is called:

A. thrombocytopenia
B. thromboembolism
C. hemophilia
D. prothrombin disease

49. Choose the following substances that you do NOT normally find in blood plasma.

A. dissolved O$_2$, CO$_2$, ions
B. glucose, amino acids
C. urea
D. plasma proteins
E. All of the choices are found in blood plasma.

50. _____ deficiency in pregnant women can lead to anemia and birth defects in the newborn.

A. Vitamin B$_{12}$
B. Vitamin C
C. Iron
D. Folic acid
51. All of the following may be found in the blood *except*:

A. fibrinogen  
B. glucose  
C. urea  
D. oxygen  
E. glycogen

52. Which kind of WBC is involved in the production of antibodies?

A. neutrophils  
B. lymphocytes  
C. monocytes  
D. eosinophils  
E. basophils

53. The granular leukocyte that stains red is the:

A. neutrophil  
B. eosinophil  
C. basophils  
D. monocyte  
E. lymphocyte

54. Blood is a:

A. type of epithelial tissue  
B. type of dense connective tissue  
C. type of loose connective tissue  
D. None of the choices are correct.

55. Which of the following are needed for clotting?

A. white blood cells and red blood cells  
B. platelets and clotting proteins  
C. hemoglobin  
D. WBC and proteins
56. Which of the following is a disorder involving white blood cells caused by a virus?

A. SCID
B. infectious mononucleosis
C. leukemia
D. agranular mast cell disease

57. The first reaction in blood clotting is:

A. fibrinogen → fibrin
B. platelets → prothrombin activator
C. prothrombin → thrombin
D. plasmin → fibrin

58. A person with excessive immature white blood cells is likely suffering from:

A. hemophilia
B. anemia
C. leukemia
D. mononucleosis

59. Aged red blood cells are destroyed in the:

A. red bone marrow
B. lungs
C. lymph nodes
D. spleen and liver

60. The rupturing of red blood cells is called:

A. sickle cell
B. hemocytosis
C. anemia
D. hemolysis
E. None of the choices are correct.

61. Which of the following is the correct pairing of plasma protein with its function?

A. gamma globulins; transport of cholesterol
B. albumin; major osmotic protein
C. fibrinogen; forms antibodies

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62. Which of the following is the correct pairing of plasma protein with its function?

A. gamma globulins; maintains blood osmotic pressure and pH  
B. albumin; forms antibodies  
C. fibrinogen; functions in the clotting cascade

63. Choose the CORRECT statement.

A. RBCs are manufactured in the red bone marrow.  
B. Stem cells differentiate.  
C. RBCs live for only about 120 days.  
D. 2 million RBCs are made each second.  
E. All of the choices are correct.

64. A person who is B positive will have:

A. A antigens, antibody B, Rh antigen  
B. B antigens, antibody B, Rh antigen  
C. B antigens, antibody A, no Rh antigen  
D. B antigens, antibody A, Rh antigen  
E. B antigens, antibody B, no Rh antigen

65. The vitamin necessary for fibrinogen and prothrombin formation (found in green vegetables and released by intestinal bacteria) is:

A. vitamin B  
B. vitamin D  
C. vitamin A  
D. vitamin E  
E. None of the choices are correct.

66. Of the agranular leukocytes, which one is in the majority?

A. eosinophils  
B. neutrophils  
C. basophils  
D. monocytes  
E. lymphocytes
67. A person with blood type AB can safely receive sterile blood from a person with this type of blood:

A. O  
B. A  
C. AB  
D. All of the choices are correct.

68. Cellular debris and old cells are cleaned up by:

A. dendritic cells in the skin  
B. neutrophils  
C. macrophages  
D. All of the choices are correct.

69. Individuals with inherited blood clotting disorders most frequent cause of death is:

A. strokes  
B. heart attacks  
C. bleeding into the brain  
D. cancer

70. The process of blood clotting requires which of the following:

A. calcium  
B. vitamin K  
C. phosphorous  
D. vitamin C  
E. calcium and vitamin K

71. Clumping of red blood cells is called:

A. hemolysis  
B. agglutination  
C. flocculation  
D. precipitation  
E. emulsification
72. Choose the CORRECT statement concerning the ABO blood typing system. If your blood type is AB:

A. you have anti-A antibodies  
B. you have anti-B antibodies  
C. you have A antigens  
D. you have B antigens  
E. you have A and B antigens

73. Which of the following is the correct pairing of types of white blood cells to their proper category?

A. agranulocyte; eosinophil  
B. granulocyte; lymphocyte  
C. agranulocyte; neutrophil  
D. granulocyte; basophil

74. What plasma protein is involved in transport?

A. albumin  
B. globulin  
C. fibrin  
D. fibrinogen

75. Red blood cell production is stimulated by:

A. a decrease in elevation  
B. an increase in oxygen  
C. erythropoietin  
D. albumin

76. Which of the following are agranulocytes?

A. monocytes  
B. neutrophils  
C. basophils  
D. lymphocytes  
E. monocytes and lymphocytes
77. The element necessary for clotting is:

A. iron  
B. calcium  
C. chlorine  
D. phosphorus  
E. sulfur

78. Which of the following is the correct percentage of the blood component?

A. 55% of blood; formed elements  
B. 45% of blood; formed elements  
C. 20% of blood; plasma  
D. 20% of blood; formed elements

79. The proteins in the blood:

A. buffer blood pH  
B. help fight disease  
C. aid in blood clotting  
D. help maintain osmotic pressure  
E. All of the choices are correct.

80. The first leukocyte to respond to infection is the:

A. neutrophil  
B. eosinophil  
C. basophils  
D. monocyte  
E. lymphocyte

81. If a thrombus becomes dislodged, it is called a:

A. prothrombus  
B. thrombin  
C. hemoembolus  
D. embolus
82. Choose the correct statement concerning the ABO blood typing system. If your blood type is O:

A. you have anti-A antibodies
B. you have anti-B antibodies
C. you have A antigens
D. you have B antigens
E. you have anti-A antibodies and you have anti-B antibodies

83. Pus forms from large numbers of dead ____ after battle with bacteria.

A. eosinophils
B. lymphocytes
C. neutrophils
D. basophils
E. monocytes

84. Which of the following is necessary for normal hemoglobin production?

A. calcium
B. potassium
C. iron
D. iodine

85. The most abundant WBC is:

A. neutrophil
B. eosinophil
C. basophils
D. monocyte
E. lymphocyte

86. A person with blood type O can safely receive sterile blood from a person with this type of blood:

A. O
B. A
C. AB
D. All of the choices are correct.
87. Which of the following does NOT carry out phagocytosis?

A. neutrophils  
B. macrophages  
C. lymphocytes

88. The long insoluble protein threads (fibrin) of a blood clot are derived from:

A. fibrinogen  
B. thrombin  
C. prothrombin  
D. platelets

89. The hereditary disorder where red blood cells form a sickle shape is:

A. sickle cell disease  
B. hemocytosis  
C. anemia  
D. hemolysis  
E. None of the choices are correct.

90. T cells and B cells are different types of:

A. monocytes  
B. mast cells  
C. lymphocytes  
D. thrombocytes
Chapter 6 Key

1. Choose the CORRECT statement(s) concerning the function of blood.
   
   a. It transports oxygen and carbon dioxide.
   b. It defends the body against infection.
   c. It helps prevent loss of blood by clotting.
   d. It transports hormones.
   E All of the choices are functions of blood.

2. The fluid that immediately surrounds tissue cells is called:
   
   a. lymph
   b. plasma
   C tissue fluid
   d. cytoplasm

3. The process of cells ingesting material or "cell eating" is called:
   
   a. phagosomes
   B phagocytosis
   c. pinocytosis
   d. cytolysis
   e. None of the choices are correct.

4. The inherited clotting disorder due to a deficiency in a clotting factor is:
   
   a. anemia
   b. leukemia
   c. carbon monoxide poisoning
   D hemophilia
5. Which of the following continuously divide producing new cells?

- a. red blood cells
- b. white blood cells
- **C** stem cells
- d. heme

6. The two major components of blood are:

- a. red blood cells and white blood cells
- b. plasma and serum
- c. plasma and red blood cells
- **D** formed elements and plasma
- e. platelets and plasma

7. The technique for determining specific protein types that are present on RBCs is called:

- a. tissue typing
- **B** blood typing
- c. DNA analysis
- d. histocompatibility

8. Henry was born without the enzyme adenosine deaminase in his stem cells which give rise to white blood cells. Henry suffers from:

- a. leukemia
- **B** severe combined immunodeficiency disease
- c. autoimmune deficiency syndrome
- d. infectious mononucleosis
9. Choose the following circumstance(s) that must occur for hemolytic disease of the newborn.

   a. the mother must be Rh\(^-\), the father Rh\(^+\), and the baby Rh\(^+\)
   b. the mother must make anti-Rh antibodies
   c. breakdown of placental tissue
   d. anti-Rh antibodies must cross the placenta
   E  All of the choices must occur.

10. Hemolytic disease of the newborn occurs when:

   a. the mother is Rh\(^-\), the father is Rh\(^+\), and the baby is Rh\(^-\)
   b. the mother is Rh\(^+\), the father is Rh\(^+\), and the baby is Rh\(^-\)
   C  the mother is Rh\(^-\), the father is Rh\(^+\), and the baby is Rh\(^+\)
   d. the mother is Rh\(^+\), the father is Rh\(^-\), and the baby is Rh\(^-\)
   e. None of the choices are correct.

11. The abnormal increase in immature lymphocytes is called:

   a. lymphocytoma
   B  leukemia
   c. leukopenia
   d. lymphomegaly
   e. None of the choices are correct.

12. Mature human red blood cells:

   a. have a nucleus
   B  are biconcave discs without a nucleus
   c. are rare in the bloodstream
   d. carry plasma
13. Choose the CORRECT statement.

a. Plasma contains fewer proteins than tissue fluid.
b. Serum is plasma plus clotting factors.
c. Cytoplasm is tissue fluid in the lymph system.
D. Plasma is serum plus clotting proteins.
e. None of the choices are correct.

14. Choose the correct statement concerning the ABO blood typing system. If your blood type is A:

a. you have anti-A antibodies
b. you have anti-B antibodies
c. you have A antigens
d. you have B antigens
E. you have anti-B antibodies and you have A antigens

15. Choose the CORRECT statement concerning the ABO blood typing system. If your blood type is B:

a. you have anti-A antibodies
b. you have anti-B antibodies
c. you have A antigens
d. you have B antigens
E. you have anti-A antibodies and you have B antigens

16. Erythrocytes are:

A. RBCs
b. WBCs
c. platelets
17. An insufficient number of red blood cells, or lack of hemoglobin result in the condition of:

a. sickle cell disease
b. hemocytosis
c. anemia
d. hemolysis
e. None of the choices are correct.

18. Which of the following are actually cell fragments and not whole cells?

a. RBCs
b. WBCs
c. platelets

19. The proteins that help regulate the production of WBCs are called:

a. leukopoietins
b. erythropoietins
c. thrombopoietins
d. colony stimulating factors

20. Rh positive red blood cells:

a. have Rh antigen
b. do not have Rh antigen

21. The most common system for typing blood is the:

a. AB system
b. ABO system
c. IEO system
d. antigenic determinant system
22. Deoxyhemoglobin is:
   a. hemoglobin plus oxygen
   b. hemoglobin plus carbon dioxide
   c. hemoglobin plus carbon monoxide
   D hemoglobin without oxygen

23. Which of the following is not a characteristic of infectious mononucleosis?
   a. caused by an Epstein-Barr virus
   b. symptoms include fever, sore throat and swollen lymph glands
   C there is uncontrolled white blood cell proliferation
   d. active EBV can be passed in saliva
   e. the EBV remains within a person's body for the rest of his/her life

24. Which of these is NOT a protein found in blood?
   a. albumin
   b. fibrinogen
   c. antibody
   D keratin
   e. prothrombin

25. The combination of oxygen and hemoglobin in the lungs forms the bright red molecule:
   a. myoglobin
   B oxyhemoglobin
   c. deoxyhemoglobin
   d. hydroxyhemoglobin
   e. None of the choices are correct.
26. Platelets are also called:
   a. erythrocytes
   b. leukocytes
   C. thrombocytes
   d. hemoglobin
   e. None of the choices are correct.

27. Which of the statements is false concerning neutrophils?
   a. They are phagocytic.
   b. They are polymorphonuclear.
   C. They are made in the lymphoid tissue.
   d. They are the first to respond to infection.
   e. They are the most abundant WBC.

28. Neutrophils and lymphocytes are types of:
   a. platelets
   b. red blood cells
   C. white blood cells
   d. plasma cells
   e. epithelial cells

29. The type of agranular leukocyte that has a kidney-shaped nucleus is the:
   a. neutrophil
   b. eosinophil
   c. basophils
   D. monocyte
   e. lymphocyte
30. Blood doping involves the use of erythropoietin by athletes to:
   a. stimulate breakdown of older red blood cells
   b. add additional hemoglobin to red blood cells
   c. stimulate formation of leukocytes to boost the immune system
   **D** increase the number of red blood cells

31. The plasma proteins called globulins:
   a. help transport hormone, cholesterol and iron
   b. come in alpha, beta and gamma forms
   c. contribute to plasma's osmotic pressure
   d. form blood clots
   **E** help transport hormones, cholesterol and iron and come in alpha, beta and gamma forms

32. The inherited clotting disorder, where the slightest bump can cause bleeding into the joints is:
   a. thalassemia
   b. sickle cell disease
   **C** hemophilia
   d. fibrinosis
   e. hemocytosis

33. The majority of carbon dioxide is transported:
   a. as CO$_2$ dissolved in the plasma
   **B** as bicarbonate ion in the plasma
   c. by hemoglobin within red blood cells
   d. as carbonic acid within red blood cells
34. Which blood type would contain anti-B antibodies, but not anti-A antibodies?

A. A  
b. B  
c. AB  
d. O  

35. Which of the following defend the body against disease?

a. RBCs  
B. WBCs  
c. platelets  

36. The small red biconcave discs (red blood cells) are also called:

A. erythrocytes  
b. leukocytes  
c. thrombocytes  
d. hemoglobin  
e. None of the choices are correct.  

37. Which of the following clotting proteins are enzymes?

a. fibrin and thromboplastin  
B. thrombin and prothrombin activator  
c. platelets and fibrin  
d. prothrombin and calcium  

38. The type of leukocyte that responds to allergies is:

a. neutrophil  
B. eosinophil  
c. basophils  
d. monocyte  
e. lymphocyte
39. There are more than 12 clotting factors that participate in clot formation. Choose the factors that are in proper sequential order.

a. thromboplastin, prothrombin activator, fibrin, fibrinogen
b. prothrombin, thrombin, prothrombin activator, fibrinogen
C. thromboplastin, prothrombin, thrombin, fibrinogen, fibrin
d. fibrin, fibrinogen, thrombin, prothrombin, thromboplastin activator

40. Choose the CORRECT statement.

a. RBCs squeeze through pores in capillaries.
B. Following infection, WBCs increase.
c. All WBCs live only 120 days.
d. RBCs are larger than WBCs.
e. All of the choices are correct.

41. Which of the following types of white blood cells is the largest?

a. lymphocytes
B. monocytes
c. neutrophils
d. eosinophils
e. basophils

42. Which of the following statements about hemoglobin is INCORRECT?

a. Hemoglobin contains iron.
b. Hemoglobin has proteins associated with it.
c. Hemoglobin will combine with oxygen.
D. Hemoglobin will not combine with carbon dioxide.
43. Platelets:
   a. phagocytize bacteria
   b. are responsible for blood type
   C initiate clotting
   d. transport oxygen

44. Which of the following is characteristic of WBCs?
   a. generally smaller than RBCs
   b. anucleate
   c. have hemoglobin
   D not as numerous as RBCs
   e. All of the choices are correct.

45. Microscopic infectious agents, such as bacteria and viruses, which are capable of causing disease, are called:
   a. virogens
   B pathogens
   c. chemical toxins
   d. miasma

46. Choose the CORRECT statement.
   a. Megakaryoblasts form platelets.
   b. Erythroblasts form erythrocytes.
   c. Myeloblasts form granular leukocytes.
   d. Monocytes and lymphocytes are agranular.
   E All of the choices are correct.
47. When blood is transferred to a test tube and prevented from clotting, it forms two layers. They are:

a. red blood cells and white blood cells
b. plasma and serum
c. plasma and red blood cells
D formed elements and plasma
e. platelets and plasma

48. Carl suffers from nosebleeds and gastrointestinal bleeding due to increased breakdown of platelets outside the marrow. This is called:

A thrombocytopenia
b. thromboembolism
c. hemophilia
d. prothrombin disease

49. Choose the following substances that you do NOT normally find in blood plasma.

a. dissolved O\textsubscript{2}, CO\textsubscript{2}, ions
b. glucose, amino acids
c. urea
d. plasma proteins
E All of the choices are found in blood plasma.

50. _____ deficiency in pregnant women can lead to anemia and birth defects in the newborn.

a. Vitamin B\textsubscript{12}
b. Vitamin C
c. Iron
D Folic acid
51. All of the following may be found in the blood except:
   a. fibrinogen
   b. glucose
   c. urea
   d. oxygen
   E glycogen

52. Which kind of WBC is involved in the production of antibodies?
   a. neutrophils
   B lymphocytes
   c. monocytes
   d. eosinophils
   e. basophils

53. The granular leukocyte that stains red is the:
   a. neutrophil
   B eosinophil
   c. basophils
   d. monocyte
   e. lymphocyte

54. Blood is a:
   a. type of epithelial tissue
   b. type of dense connective tissue
   C type of loose connective tissue
   d. None of the choices are correct.
55. Which of the following are needed for clotting?
   a. white blood cells and red blood cells
   B platelets and clotting proteins
   c. hemoglobin
   d. WBC and proteins

56. Which of the following is a disorder involving white blood cells caused by a virus?
   a. SCID
   B infectious mononucleosis
   c. leukemia
   d. agranular mast cell disease

57. The first reaction in blood clotting is:
   a. fibrinogen → fibrin
   B platelets → prothrombin activator
   c. prothrombin → thrombin
   d. plasmin → fibrin

58. A person with excessive immature white blood cells is likely suffering from:
   a. hemophilia
   b. anemia
   C leukemia
   d. mononucleosis

59. Aged red blood cells are destroyed in the:
   a. red bone marrow
   b. lungs
   c. lymph nodes
   D spleen and liver
60. The rupturing of red blood cells is called:
   a. sickle cell  
   b. hemocytosis  
   c. anemia  
   D hemolysis  
   e. None of the choices are correct.

61. Which of the following is the correct pairing of plasma protein with its function?
   a. gamma globulins; transport of cholesterol  
   B albumin; major osmotic protein  
   c. fibrinogen; forms antibodies

62. Which of the following is the correct pairing of plasma protein with its function?
   a. gamma globulins; maintains blood osmotic pressure and pH  
   b. albumin; forms antibodies  
   C fibrinogen; functions in the clotting cascade

63. Choose the CORRECT statement.
   a. RBCs are manufactured in the red bone marrow.  
   b. Stem cells differentiate.  
   c. RBCs live for only about 120 days.  
   d. 2 million RBCs are made each second.  
   E All of the choices are correct.
64. A person who is B positive will have:
   a. A antigens, antibody B, Rh antigen
   b. B antigens, antibody B, Rh antigen
   c. B antigens, antibody A, no Rh antigen
   D B antigens, antibody A, Rh antigen
   e. B antigens, antibody B, no Rh antigen

65. The vitamin necessary for fibrinogen and prothrombin formation (found in green vegetables and released by intestinal bacteria) is:
   a. vitamin B
   b. vitamin D
   c. vitamin A
   d. vitamin E
   E None of the choices are correct.

66. Of the agranular leukocytes, which one is in the majority?
   a. eosinophils
   b. neutrophils
   c. basophils
   d. monocytes
   E lymphocytes

67. A person with blood type AB can safely receive sterile blood from a person with this type of blood:
   a. O
   b. A
   c. AB
   D All of the choices are correct.
68. Cellular debris and old cells are cleaned up by:
   a. dendritic cells in the skin
   b. neutrophils
   c. macrophages
   **D** All of the choices are correct.

69. Individuals with inherited blood clotting disorders most frequent cause of death is:
   a. strokes
   b. heart attacks
   **C** bleeding into the brain
   d. cancer

70. The process of blood clotting requires which of the following:
   a. calcium
   b. vitamin K
   c. phosphorous
   d. vitamin C
   **E** calcium and vitamin K

71. Clumping of red blood cells is called:
   a. hemolysis
   **B** agglutination
   c. flocculation
   d. precipitation
   e. emulsification
72. Choose the CORRECT statement concerning the ABO blood typing system. If your blood type is AB:

a. you have anti-A antibodies  
b. you have anti-B antibodies  
c. you have A antigens  
d. you have B antigens  
E you have A and B antigens

73. Which of the following is the correct pairing of types of white blood cells to their proper category?

a. agranulocyte; eosinophil  
b. granulocyte; lymphocyte  
c. agranulocyte; neutrophil  
D granulocyte; basophil

74. What plasma protein is involved in transport?

a. albumin  
B globulin  
c. fibrin  
d. fibrinogen

75. Red blood cell production is stimulated by:

a. a decrease in elevation  
b. an increase in oxygen  
C erythropoietin  
d. albumin
76. Which of the following are agranulocytes?

a. monocytes
b. neutrophils
c. basophils
d. lymphocytes
E monocytes and lymphocytes

77. The element necessary for clotting is:

a. iron
B calcium
c. chlorine
d. phosphorus
e. sulfur

78. Which of the following is the correct percentage of the blood component?

a. 55% of blood; formed elements
B 45% of blood; formed elements
c. 20% of blood; plasma
d. 20% of blood; formed elements

79. The proteins in the blood:

a. buffer blood pH
b. help fight disease
c. aid in blood clotting
d. help maintain osmotic pressure
E All of the choices are correct.
80. The first leukocyte to respond to infection is the:

A. neutrophil  
B. eosinophil  
C. basophils  
D. monocyte  
E. lymphocyte

81. If a thrombus becomes dislodged, it is called a:

A. prothrombus  
B. thrombin  
C. hemoembolus  
D. embolus

82. Choose the correct statement concerning the ABO blood typing system. If your blood type is O:

A. you have anti-A antibodies  
B. you have anti-B antibodies  
C. you have A antigens  
D. you have B antigens  
E. you have anti-A antibodies and you have anti-B antibodies

83. Pus forms from large numbers of dead ____ after battle with bacteria.

A. eosinophils  
B. lymphocytes  
C. neutrophils  
D. basophils  
E. monocytes
84. Which of the following is necessary for normal hemoglobin production?
   a. calcium  
   b. potassium  
   C iron  
   d. iodine

85. The most abundant WBC is:
   A neutrophil  
   b. eosinophil  
   c. basophils  
   d. monocyte  
   e. lymphocyte

86. A person with blood type O can safely receive sterile blood from a person with this type of blood:
   A O  
   b. A  
   c. AB  
   d. All of the choices are correct.

87. Which of the following does NOT carry out phagocytosis?
   a. neutrophils  
   b. macrophages  
   C lymphocytes

88. The long insoluble protein threads (fibrin) of a blood clot are derived from:
   A fibrinogen  
   b. thrombin  
   c. prothrombin  
   d. platelets
89. The hereditary disorder where red blood cells form a sickle shape is:

A sickle cell disease  
b. hemocytosis  
c. anemia  
d. hemolysis  
e. None of the choices are correct.

90. T cells and B cells are different types of:

a. monocytes  
b. mast cells  
C lymphocytes  
d. thrombocytes
## Chapter 6 Summary

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