1) Choose the disease that is most closely related to the given phrase.

   a disease of the bone marrow characterized by uncontrolled production of white blood cells

   A) meningitis    C) angina pectoris
   B) leukemia      D) emphysema

2) Which condition results from brain cell damage due to blocked or burst blood vessels and is characterized by impaired speech or motor patterns?

   A) stroke    C) polio
   B) diabetes  D) meningitis

3) When a person does strenuous exercise, small blood vessels (capillaries) near the surface of the skin increase in diameter. This change allows the body to be cooled. These statements best illustrate

   A) synthesis    C) homeostasis
   B) locomotion   D) excretion

4) The diagrams below represent different types of cells found in the human body. Which type of cell is a component of blood tissue?

   A)    B)    C)    D)

5) Which part of the human blood is primarily responsible for transporting nutrients, hormones, and wastes?

   A) platelet    C) red blood cell
   B) white blood cell    D) plasma

6) Which cells are able to carry on the process of phagocytosis?

   A) white blood cells    C) nerve cells
   B) red blood cells      D) epidermal cells

7) Which structures in human blood contain enzyme molecules necessary for the clotting process?

   A) phagocytes    C) red blood cells
   B) platelets    D) lymphocytes

8) Human blood types in the ABO blood group are identified by

   A) clotting factors in the plasma
   B) antigen-antibody reactions
   C) microscopic examination of white blood cells
   D) a series of enzyme-controlled synthesis reactions

9) Whole blood type O may safely be given to people with which types of blood?

   A) A and B, only    C) O and B, only
   B) A, B, AB, and O    D) AB and A, only

Questions 10 and 11 refer to the following:

10) The major function of cell A is to

   A) engulf invading bacteria
   B) transport oxygen
   C) produce antibodies
   D) initiate blood clot formation

11) Materials passing between body cells and blood must pass through intercellular fluid (ICF), which is located in area

   A) 1    B) 2    C) 3    D) 4

12) In humans, which of the following is produced within certain bones?

   A) striated muscle cells
   B) urea
   C) red blood cells
   D) bile
13) The diagram below represents part of the human respiratory system.

![Diagram of human respiratory system](image)

The heart chamber which most directly pumps blood to the vessel network at A is the
A) right atrium  
B) left ventricle  
C) right ventricle  
D) left atrium

14) The diagram below represents the pathway of the blood throughout the body.

![Blood pathway diagram](image)

Within which structure are red blood cells broken down?
A) 9  
B) 6  
C) 1  
D) 7

15) What is a major difference between red blood cells and white blood cells?
A) Red blood cells contain hemoglobin, but white blood cells do not.  
B) Red blood cells engulf foreign bacteria, but white blood cells do not.  
C) Red blood cells can move, but white blood cells cannot.  
D) Red blood cells contain nuclei, but white blood cells do not.

16) In humans, which are blood cells that have the ability to engulf bacteria?
A) red blood cells  
B) phagocytes  
C) capillaries  
D) platelets

17) A biochemical compound that readily combines with oxygen and distributes it throughout the human body is
A) acetylcholine  
B) water  
C) hemoglobin  
D) urea
18) The chart below gives incomplete information about various systems of the human body which can fail, causing a specific malfunction.

<table>
<thead>
<tr>
<th>Malfunction of Human Body</th>
<th>System Affected</th>
<th>Characteristic of Malfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Endocrine</td>
<td>Not enough insulin produced by the pancreas, causing high levels of sugar in blood and urine; weakness results</td>
</tr>
<tr>
<td>Leukemia</td>
<td>B</td>
<td>Cancer of the bone marrow, causing uncontrolled production of white blood cells</td>
</tr>
<tr>
<td>Emphysema</td>
<td>Respiratory</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>Nervous</td>
<td>Inflammation of membranes surrounding the brain and spinal cord caused by bacterial or viral infection</td>
</tr>
</tbody>
</table>

The name of which system should be included in the table at B?
A) digestive              B) endocrine              C) circulatory              D) reproductive

19) Which statement most accurately describes human veins?
A) They are thick, muscular vessels that contain valves and transport blood away from the heart to body tissues.
B) They are thin-walled vessels through which nutrients and gases diffuse to body tissues.
C) They are thick, muscular vessels that help pump blood away from the heart to body tissues.
D) They are relatively thin-walled vessels that transport blood back to the heart from the body tissues.

20) Which type of vessel normally contains valves that prevent the backward flow of materials?
A) capillary              B) vein              C) arteriole              D) artery

21) The thin-walled vessels of the circulatory system where most oxygen and carbon dioxide are exchanged are
A) veins              B) arteries              C) capillaries              D) alveoli

22) For blood to pass through the heart from the left atrium to the left ventricle, it must first pass through
A) a capillary              B) a vein              C) a valve              D) an artery

Questions 22 and 23 refer to the following:

The schematic diagram below shows the blood flow throughout the human body.

23) Which chambers of the heart contain blood which has the highest concentration of oxygen?
A) 2 and 4              B) 1 and 3              C) 1 and 2              D) 3 and 4

24) Which blood vessels contain blood with the lowest concentration of oxygen?
A) A and D              B) D and B              C) C and A              D) B and C

25) Humans breathe more rapidly during exercise than before it because during exercise the blood contains
A) an increased level of oxygen              B) a decreased amount of hemoglobin              C) an increased level of carbon dioxide              D) a decreased number of red blood cells
Questions 25 through 27 refer to the following:

The diagram below represents the human heart, and the direction of blood flow is indicated by the arrows.

26) The aorta is represented by number
A) 1 B) 6 C) 4 D) 8

27) Deoxygenated blood returns to the heart through the structure represented by number
A) 5 B) 8 C) 3 D) 7

28) The chamber that pumps blood to all parts of the body except the lungs is represented by number
A) 4 B) 2 C) 3 D) 1

29) Which is a characteristic of lymph nodes?
A) They produce new red blood cells.
B) They move fluids by means of a muscular pump.
C) They carry blood under great pressure.
D) They contain phagocytic cells.

30) Which statement best describes the human respiratory system?
A) It is composed of a network of moist passageways that permit air to flow from the external environment to the lungs.
B) Gases diffuse across membranes on both the external and internal surfaces of the body.
C) Each cell of the human body is in direct contact with the external environment, and gas exchange occurs by diffusion.
D) The external body surface is kept moist to allow for gas exchange.

31) For each statement, select the human system that is best described by the statement.
- This system includes the pharynx, trachea, and alveoli.
  A) endocrine  C) nervous
  B) respiratory  D) excretory

Questions 31 and 32 refer to the following:

32) Which sequence correctly represents the flow of blood through the heart?
A) 1 → 2 and 3 → 4  C) 4 → 3 and 2 → 1
B) 2 → 1 and 3 → 4  D) 1 → 2 and 4 → 3

33) In the ventricles, deoxygenated blood is prevented from mixing with oxygenated blood by the structure labeled
A) A B) B C) D D) C

34) Inflammation of certain membranes in the human respiratory system is known as
A) gout  C) bronchitis
B) anemia  D) meningitis

35) For the given phrase, choose from the list below, the transport pathway that is most closely related to the phrase.
- Carries blood from the heart to the lungs and from the lungs to the heart
  A) coronary circulation
  B) pulmonary circulation
  C) lymphatic circulation
  D) systemic circulation

36) Bacteria and dead cells are removed from circulatory fluid in the
A) lymph nodes  C) urinary bladder
B) alveoli  D) gallbladder

37) Which sequence represents the direction of flow of carbon dioxide as it passes out of the respiratory system into the external environment?
A) alveoli → bronchi → pharynx → bronchioles → trachea → nasal cavity
B) alveoli → bronchioles → bronchi → trachea → pharynx → nasal cavity
C) alveoli → trachea → bronchioles → bronchi → pharynx → nasal cavity
D) alveoli → pharynx → trachea → bronchioles → bronchi → nasal cavity
38) For the given phrase, choose from the list below, the transport pathway that is most closely related to the phrase.

Carries blood from the heart to the digestive and reproductive structures of the body
A) pulmonary circulation  
B) systemic circulation  
C) lymphatic circulation  
D) coronary circulation

39) The apparatus shown in the diagram below represents a model of part of the human respiratory system.

The movement of which part demonstrates the contraction and relaxation of the diaphragm during breathing?
A) 1  B) 2  C) 3  D) 4

Questions 39 through 41 refer to the following:

The diagram below represents part of the human respiratory system.

40) The blood vessels (B) surrounding these air sacs are known as
A) lymphatic ducts  C) veins  
B) capillaries  D) arteries

41) These air sacs are known as
A) tracheae  C) alveoli  
B) bronchioles  D) bronchi

42) Compared to the blood entering A, the blood leaving the vessel network at C has a lower concentration of
A) oxygen and hemoglobin  
B) hemoglobin and carbon dioxide  
C) carbon dioxide  
D) oxygen

43) Smoking may damage the respiratory system because deposits from the smoke can
A) lower blood pressure in the mucous membranes of the bronchioles  
B) block the transmission of impulses that regulate breathing  
C) trigger the release of antigens by the alveoli  
D) interfere with ciliary action in the trachea

44) Which body structures have walls one cell thick?
A) lymph vessels and stomach  
B) trachea and bronchi  
C) veins and arteries  
D) capillaries and alveoli

45) For the given phrase, choose from the list below, the transport pathway that is most closely related to the phrase.

Contains nodes that filter foreign substances such as bacteria from transport fluid
A) lymphatic circulation  
B) pulmonary circulation  
C) coronary circulation  
D) systemic circulation

46) Which condition would most directly result in the production of lactic acid by some cells of the human body?
A) an excess of oxygen reaching the cells  
B) an insufficient amount of oxygen reaching the cells  
C) an insufficient amount of nitrogen in the atmosphere  
D) an excess of nitrogen in the atmosphere

47) A person who consumes large amounts of saturated fats may increase his or her chances of developing
A) viral pneumonia  
B) hemophilia  
C) cardiovascular disease  
D) meningitis
48) Deposits from cigarette smoke are most likely to interfere with the ciliated mucous membranes located in both the
A) trachea and esophagus
B) nasal cavity and trachea
C) epiglottis and esophagus
D) alveoli and liver

49) The exchange of air between the human body and the environment is a result of the rhythmic contractions of the rib cage muscles and the
A) heart
B) diaphragm
C) trachea
D) lung

50) Which excretory structure removes carbon dioxide and water from the blood?
A) liver
B) sweat gland
C) alveolus
D) nephron