circulation-respiration formative quiz

Name: _______________________________ Date: ________________

1. When Lance goes jogging, his heart rate increases to pump blood faster and supply his muscles with more oxygen. Which of the following helps to maintain homeostasis in response to this increase in heart rate?
   
   A. an increase in digestion  
   B. an increase in respiration  
   C. a decrease in perspiration  
   D. a decrease in bone growth

2. Which of the following is a correct order in which air moves through the human respiratory system when a person inhales?
   
   A. nose, larynx, trachea, pharynx, bronchi, lungs  
   B. nose, pharynx, larynx, trachea, bronchi, lungs  
   C. pharynx, bronchi, nose, larynx, trachea, lungs  
   D. pharynx, nose, trachea, bronchi, larynx, lungs

3. All animals need air to survive. An insect gets air through tiny holes on the sides of its body. A whale breathes through a blow hole. What body part do fish use to breathe?
   
   A. gills  B. skin  C. nose  D. mouth

4. The diagram below shows a major system of the human body.

   ![Diagram of the human body]

   Which of the following best describes the function of this system?
   
   A. absorbing nutrients from food  
   B. protecting the body from infection  
   C. exchanging gases with the environment  
   D. responding to stimuli in the environment

5. Which of the following is the best example of an organism maintaining homeostasis?
   
   A. a wolf panting after a chase  
   B. a spider catching an insect in a web  
   C. a cricket becoming infected by a virus  
   D. a mole digging tunnels in the ground
6. Atherosclerosis is a condition in which substances such as fats and cholesterol are deposited on the inside walls of arteries, resulting in a decrease in the internal diameter of the arteries. This directly interferes with which of the following processes in the body?

A. the production of red blood cells  
B. the delivery of oxygen to body tissues  
C. the release of insulin to regulate blood sugar  
D. the transmission of nerve impulses to the heart

7. The cells of the nasal cavity and the trachea are lined with cilia. Which of the following describes a purpose of the cilia?

A. to cool air that is entering the respiratory system  
B. to help move trapped particles out of the respiratory system  
C. to help produce sound as air moves out of the respiratory system  
D. to increase the surface area for gas exchange in the respiratory system

8. The circulatory system is directly responsible for which of the following?

A. breaking down food  
B. transmitting nerve impulses  
C. transporting nutrients to cells  
D. controlling movement of muscles

9. Which of the following statements best explains why oxygen diffuses from the alveoli into the blood?

A. The diaphragm draws oxygen into the alveoli at a rapid speed.  
B. Alveoli cells contain hemoglobin to transfer gases to the blood.  
C. The concentration of oxygen is greater in the alveoli than in the blood.  
D. Red blood cells move one at a time through the capillaries surrounding the alveoli.

10. Which of these directly allows blood cells to transport oxygen to various parts of the body?

A. carbon dioxide  
B. hemoglobin  
C. antibodies  
D. platelets

11. The diagram below shows the levels of organization in a multicellular organism.

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Cells → Tissue → Organs → Organ systems → Organism
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Which level of organization is made up of cells working together to do just one job?

A. cells  
B. tissue  
C. organ systems  
D. organism
12. Which part of the blood is correctly matched with its normal function?

A. platelet — blood clot formation
B. lymphocyte — carbon dioxide transport
C. red blood cell — defense against infection
D. phagocyte — oxygen transport

13. In order to function effectively in gas exchange, alveoli must be in close association with

A. arteries  B. veins
C. capillaries  D. lacteals

14. Which blood vessels carry oxygenated blood from the lungs to the left atrium?

A. vena cavae  B. pulmonary arteries
C. pulmonary veins  D. coronary arteries

15. An increase in the amount of carbon dioxide in the blood stimulates the respiratory center of the brain. As a result, impulses are sent from the

A. medulla to the diaphragm, increasing the rate of breathing
B. cerebrum to the chest muscles, decreasing the rate of breathing
C. medulla to the trachea, causing it to constrict
D. cerebrum to the alveoli, causing them to actively transport oxygen

16. Which sequence correctly represents the flow of blood through the heart?

A. 4 → 3 and 2 → 1  B. 2 → 1 and 3 → 4
C. 1 → 2 and 3 → 4  D. 1 → 2 and 4 → 3

17. In the ventricles, deoxygenated blood is prevented from mixing with oxygenated blood by the structure labeled

A. A  B. B  C. C  D. D
18. The data table shown summarizes the results of an investigation of the effect of temperature on the respiration rate of a goldfish.

<table>
<thead>
<tr>
<th>Water Temperature (°C)</th>
<th>Number of Gill Movements per Minute</th>
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</thead>
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<tr>
<td>5</td>
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<td>10</td>
<td>15</td>
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<td>30</td>
<td>60</td>
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<td>40</td>
<td>100</td>
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</table>

What is the most probable respiration rate of the fish at 25°C?

A. 15 gill movements per minute  
B. 20 gill movements per minute  
C. 50 gill movements per minute  
D. 80 gill movements per minute

19. The concentration of oxygen is highest in the blood flowing through the

A. superior vena cava  
B. inferior vena cava  
C. pulmonary vein  
D. pulmonary artery

20. An internal respiratory surface is a beneficial adaptation for land animals because internal surfaces

A. are too thick for pollutants to enter the blood  
B. prevent hemoglobin from diffusing into the atmosphere  
C. remain moist for efficient gas exchange  
D. are reduced in area for increased gas transport

21. The exchange of materials between the blood and the intercellular fluid (ICF) occurs readily through structures known as

A. arteries  
B. veins  
C. capillaries  
D. villi
22. Which sequence represents normal blood flow in pulmonary circulation?

A. $2 \to 5 \to 7 \to 4$  
B. $4 \to 8 \to 1 \to 6$
C. $1 \to 6 \to 2 \to 5$  
D. $5 \to 7 \to 3 \to 8$

23. Which structures are most closely associated with the transport of deoxygenated blood?

A. $A$, $B$, and $C$  
B. $B$, $F$, and $I$
C. $C$, $D$, and $E$  
D. $D$, $H$, and $I$

24. A structure that prevents the backflow of blood into an atrium is indicated by the letter

A. $G$  
B. $B$  
C. $C$  
D. $H$
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25. Which transport vessel is correctly paired with its usual function?

A. lymph vessel—carries blood toward the heart
B. capillary—provides a site for the exchange of materials between the blood and body tissues
C. artery—filters bacteria and dead cells from the lymph and the blood
D. vein—produces white blood cells

26. A blockage in structure A would directly reduce blood flow to the

A. heart  B. lungs  C. liver  D. brain

27. The breathing rate of a human is regulated by the

A. concentration of nitrogen in the lungs
B. pressure of the air in the trachea
C. concentration of carbon dioxide in the blood
D. pressure of the blood in the capillaries

28. Which function of a part of the human respiratory system is represented in the diagram?

A. gas exchange
B. cellular respiration
C. external cyclosis
D. active transport

29. Which sequence correctly indicates the branching pattern of the human respiratory system?

A. trachea → bronchi → bronchioles → alveoli
B. trachea → bronchioles → bronchi → alveoli
C. alveoli → trachea → bronchioles → bronchi
D. alveoli → bronchioles → trachea → bronchi
30. The chart shown represents the concentration of gases in inhaled and exhaled air in humans.

<table>
<thead>
<tr>
<th>%O₂</th>
<th>%CO₂</th>
<th>%N₂</th>
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<td>Inhaled air</td>
<td>20.9</td>
<td>0.04</td>
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<tr>
<td>Exhaled air</td>
<td>14.0</td>
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What is the reason for the difference in the O₂ and CO₂ concentrations of inhaled and exhaled air?

A. In cellular respiration, O₂ is used and CO₂ is produced.
B. In cellular respiration, CO₂ is used and O₂ is produced.
C. O₂ and CO₂ diffuse easily because they are large molecules.
D. O₂ and CO₂ are actively transported across thin, moist membranes.

31. The diagram represents a demonstration of the breathing process in humans. The balloons represent lungs. The change in the balloons is brought about by

A. a change in air composition outside the bell jar
B. a change in air pressure inside the bell jar
C. an expansion of the balloons, which pulls the rubber sheet into the bell jar
D. a contraction of the balloons, which forces air into the bell jar
32. Which statement best describes the structure indicated by letter X in the diagram shown?

A. It is kept open by rings of cartilage.
B. It is lined with a mucous membrane that filters, moistens, and warms the air.
C. It is made up of alveoli.
D. It contains ciliated bronchioles to filter the incoming air.

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

![Diagram of the human heart with arrows indicating blood flow.]

Deoxygenated blood returns to the heart through the structure represented by number

A. 8  B. 7  C. 3  D. 5

34. The graph shown represents relative blood pressure in human circulatory structures A through D.

![Graph showing relative blood pressure in different circulatory structures.]

A heavy, muscular ventricle would be found as part of structure

A. A  B. B  C. C  D. D
35. In the human circulatory system, most of the end products of nutrition are carried in the
A. white blood cells  B. red blood cells  
C. platelets  D. plasma

36. Cardiovascular diseases interfere most directly with the normal functioning of system

37. Which structure pumps blood directly to the lungs?

38. Which structure contains blood with the highest oxygen concentration?

39. Oxygen molecules absorbed by moist respiratory surfaces in humans diffuse immediately into
A. endocrine glands  B. blood capillaries
C. external tubules  D. skin pores
40. 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. diaphragm       B. lung
   C. trachea         D. heart

41. In humans, the exchange of respiratory gases occurs within the
   A. nose            B. trachea
   C. bronchial tubes D. alveoli
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