Key

Respiration Review

Study PLOs: C8-C10 I crossed off questions - that you don't need to worry about

1. A healthy person takes several successive, rapid, deep breaths forcing air out of the lungs after each breath. There will be a pause before normal breathing movements return because of a) an accumulation of lactic acid b) temporary fatigue in the rib muscles c) insufficient carbon dioxide in the blood d) the time it takes nerve impulses to reach the diaphragm
2. As temperature increases, the amount of oxygen carried by hemoglobin a) increases b) decreases c) remains the same d) doubles
3. As the temperature increases, the amount of oxygen carried by hemoglobin will a) increase b) decrease c) remain the same d) increase to 100%
4. Blood richest in oxygen is found in the a) inferior vena cava b) superior vena cava c) pulmonary arteries d) pulmonary veins
5. By what route does CO2 leave the body? a) pulmonary artery > alveolus > bronchus > bronchiole > trachea > pharynx > larynx b) pulmonary vein > bronchiole > alveolus > bronchus > trachea > pharynx > larynx c) pulmonary artery > alveolus > bronchiole > bronchus > trachea > larynx > pharynx d) pulmonary vein > alveolus > bronchus > bronchiole > trachea > larynx > pharynx
6. Carbon monoxide poisoning can be fatal. Its poisonous nature is due to a) its effect on the pH of the blood b) its effect on the osmotic pressure of the blood c) its effect on proteins d) its preferential combination with Hb
7. Carbonic anhydrase a) is a digestive enzyme b) is present in red cells c) speeds up combination of CO2 with water d) both b and c are true e) all of these are true
8. Due to a head injury, a patient's ability to breathe has been impaired. Where has the damage likely occurred? a) cerebrum b) cerebellum c) hypothalamus d) medulla oblongata
9. Gases move into and out of a) small arteries b) small veins c) arterioles d) capillaries
10. During expiration a) rib muscles contract, diaphragm relaxes b) rib muscles relax, diaphragm relaxes c) rib muscles contract, diaphragm contracts c) rib muscles relax, diaphragm contracts
11. Hemoglobin binds to oxygen better under what conditions? a) slightly acidic b) slightly basic c) hot as hell d) frozen cold
12. Hemoglobin is useful because a) it transports O2 b) it transports CO2 c) it acts as a buffer (helps to maintain pH) d) all of these e) a and b only
13. High concentrations of ~~bicarbonate ion~~ H^+ or CO_2 in the blood will result in a) increased rate of breathing b) decreased rate of breathing c) increased pressure in the chest cavity d) decreased nervous stimulation of the diaphragm
14. If you hold your breathe a) you could die of suffocation b) rising oxygen concentration will stimulate the breathing center c) accumulated carbon dioxide will force resumption of breathing d) increased nitrogen concentration will have a toxic effect
15. Impulses from the fully inflated lungs to the breathing center suppress the stimulating effect of CO2 in the blood. a) true b) false
16. In humans, the lungs are caused to inflate when the a) rib muscles contract b) diaphragm muscle contracts c) rib muscles and diaphragm contracts d) diaphragm relaxes e) rib muscles and diaphragm relaxes
17. Inspiration involves a) movement of diaphragm down and rib cage out b) movement of diaphragm only c) movement of rib cage only d) movement of diaphragm up and rib cage in e) none of these
18. Most of the carbon dioxide transported in the plasma is in the form of a) bicarbonate ions b) gas bubbles c) oxyhemoglobin d) HHb e) carbaminohemoglobin
19. Most of the oxygen picked up by the blood in the lungs a) dissolves in the plasma b) unites with hemoglobin c) forms microscopic bubbles d) diffuses into the alveoli
20. Oxygen is carried in the blood as a) oxyhemoglobin b) O2 c) CO2 d) HCO3-
21. The Adam's apple is actually a part of the a) pharynx b) larynx c) glottis d) vocal cords e) trachea
22. The cartilage rings in the walls of the mammalian trachea hold this tube open so that food can pass down it more easily a) true b) false

23. The enzyme carbonic anhydrase speeds up the reaction between a) oxygen and hemoglobin b) carbon dioxide and water c) bicarbonate ions and water d) carbon dioxide and hemoglobin
24. The exchange of gases between red blood cells and tissue cells is called a) cellular respiration b) internal respiration c) external respiration d) capillary respiration
25. The exchange of gases between the lungs and the blood occurs by the process of a) diffusion b) osmosis c) absorption d) active transport
26. The exchange of gases between the lungs and the blood occurs by the process of a) cellular respiration b) internal respiration c) external respiration d) capillary respiration
27. The function of the cilia lining the trachea is to a) secrete mucus b) move air in and out of the lungs c) increase the surface area for gas exchange d) move dust and mucus up the trachea
28. The lungs are contained within an air-tight compartment within the thoracic cavity by a) two pleural membranes b) smooth epithelial tissue c) pseudostratified ciliated epithelial tissue d) sinoatrial tissue
29. The nasal passages join with the oral passage to form a) the larynx b) the pharynx c) the trachea d) the uvula
30. The rate of breathing is chiefly dependent on chemical factors in the blood. Which of the following is not an important factor? a) O2 concentration b) Hemoglobin concentration c) CO2 concentration d) all of these
31. The rate of release of oxygen from oxyhemoglobin (HbO2 ----> Hb + O2) will increase under which of the following conditions? a) increase in pH b) decrease in body temperature c) increase in CO2 concentration d) high concentration of O2 in the tissues decrease in pH or increase in temp
32. The respiratory tract is lined with a) ciliated, pseudostratified epithelial cells b) smooth muscle c) nervous tissue d) squamous epithelial cells
33. The vocal cords are found in the a) pharynx b) larynx c) glottis d) vocal cords
34. Under what conditions will oxygen be readily released from red blood cells? a) cool and basic b) cool and acidic c) warm and basic d) warm and acidic
35. What causes air to enter the lungs? a) smaller volume within the thoracic cavity b) reduced pressure within the lungs c) increased muscle contraction of smooth muscle lining ribs d) availability of hemoglobin-rich blood at capillary-alveoli exchange
36. When trying to stimulate breathing, it is better to give a mixture of CO2 and O2 than to give O2 alone because a) pure oxygen causes you to breathe too rapidly b) CO2 and O2 together exert a grater pressure than an equal amount of O2 c) CO2 buildup in the blood stimulates the respiratory center of the brain d) O2 causes lactic acid buildup, and the change in pH prevents breathes
37. Which of the following processes would be affected first by a lack of oxygen in a cell? a) osmosis b) diffusion c) active transport d) facilitated transported due to lack of cellular respiration - lack of ATP production
38. Which of the following takes place during inhalation a) the epiglottis closes b) the ribs move down c) the diapragm moves up d) chest cavity pressure decreases
39. Which part of the respiratory system will have the least amount of cartilage and the thinnest walls? a) larynx b) trachea c) bronchi d) bronchioles e) pharynx
40. Why do you stop inhaling at the end of inspiration? a) conscious control of the breathing center forces contraction of diaphragm to cease b) increasing oxygen levels in blood feed back to respiratory center c) decreasing CO2 levels feed back to respiratory center d) stretch receptors in alveoli feed back to respiratory center

Short Answer

1. In what 3 forms is carbon dioxide carried in the blood? HCO_3^- or $HbCO_2$ or CO_2

2. Describe the reaction whereby H_20 and CO_2 are produced in the lung capillaries. Include any enzymes that are involved in the reaction.

$H^+ + HCO_3^- \xrightarrow{C.A} H_2CO_3 \xrightarrow{\text{carbonic anhydrase}} H_2O + CO_2$

3. Describe the role of hemoglobin, hydrogen ions, and carbonic anhydrase in the exchange of gases at the tissue level (internal respiration).

$HbO_2 \rightarrow Hb + O_2 \rightarrow$ tissue

$H_2O + CO_2 \xrightarrow{C.A} H_2CO_3 \rightarrow H^+ + HCO_3^-$

$H^+ + Hb \rightarrow HHb$