Respiratory Lecture Test Questions – Set 3

1. The pressure of a gas:
   a. is inversely proportional to its volume
   b. is unaffected by temperature changes
   c. is directly proportional to its volume
   d. does not affect the amount which will dissolve in a liquid
   e. none of the above

2. The pressure of a gas:
   a. is directly proportional to its volume
   b. is inversely proportional to its volume
   c. is unaffected by temperature changes
   d. does not affect the amount which will dissolve in a liquid
   e. none of the above

3. The movement of oxygen from the blood into tissue cells is caused by:
   a. a gradient in the partial pressure of oxygen
   b. secretion of oxygen by the red blood cells
   c. the blood pressure
   d. the solubility of carbon dioxide in the cell membrane
   e. active transport

4. Oxygen passes into the blood from the alveolar air by the process of:
   a. active transport
   b. diffusion
   c. pinocytosis
   d. transpiration
   e. hyperpnea

5. Exhaled air contains:
   a. heat (above external temperature, normally)
   b. water vapor
   c. carbon dioxide (higher level than inhaled)
   d. all of the above
   e. none of the above

6. Gas exchange will be influenced by:
   a. available alveolar surface area
   b. membrane permeabilities
   c. blood pressure and flow
   d. partial pressures of the gases
   e. all of the above are variables

7. O₂ and CO₂ are exchanged in the lungs and through all cell membranes by:
   a. active transport
   b. diffusion
   c. facilitated transport
   d. osmosis
   e. all of the above are utilized
8. Diffusion of O₂ into tissue fluid from systemic capillaries is continuous, due to:
   a. O₂ passing into cytoplasm from tissue fluid
   b. O₂ being expended in cellular respiration
   c. O₂ depleted blood circulating out into veins
   d. O₂ laden blood circulating in from arteries
   e. all of the above

9. A PO₂ of 40 mmHg represents what degree of saturation of the blood:
   a. 5%
   b. 75%
   c. 95%
   d. 25%
   e. 1%

10. Which of the following gas pressure situations would be correct for blood just entering the lungs:
    a. alveolar PO₂=100mm and lung capillary PO₂=100mm
    b. alveolar PO₂=50mm and lung capillary PO₂=100mm
    c. alveolar PCO₂=46mm and lung capillary PCO₂=40mm
    d. alveolar PCO₂=40mm and lung capillary PCO₂=46mm
    e. alveolar PCO₂=46mm and lung capillary PCO₂=46mm

11. Which of the following gas pressure situations would be correct:
    a. systemic capillary PO₂=100mm and tissue fluid PO₂=100mm
    b. systemic capillary PO₂=100mm and tissue fluid PO₂=40mm
    c. systemic capillary PO₂=40mm and tissue fluid PO₂=100mm
    d. systemic capillary PCO₂=40mm and tissue fluid PCO₂=40mm
    e. systemic capillary PCO₂=46mm and tissue fluid PCO₂=40mm

12. Within the blood most of the oxygen is bound with:
    a. the globin portion of hemoglobin
    b. the outer red blood cell membrane
    c. the iron of hemoglobin’s heme portion
    d. carbonates, to form carbonic acid
    e. plasma albumins

13. Oxygen transfer from the alveoli to the blood for transport is aided by the:
    a. affinity of hemoglobin for carbon monoxide
    b. higher oxygen partial pressure of the blood
    c. affinity of hemoglobin for carbon dioxide
    d. lower oxygen partial pressure in the blood
    e. pulmonary capillary colloid osmotic pressure

14. Most of the carbon dioxide produced by the tissue cells and picked up by the blood is carried in plasma:
    a. in simple physical solution, as free CO₂
    b. in the form of oxyhemoglobin
    c. as carbhemoglobin
    d. as bicarbonate--HCO₃⁻
    e. at the red blood cell surfaces
15. **The least amount of CO₂ is carried in the blood as:**
   a. carbhemoglobin (carbamino acid)
   b. free solution—as CO₂
   c. at the red blood cell surfaces
   d. bicarbonate—HCO₃⁻
   e. oxyhemoglobin

16. **Besides being a waste product of cellular metabolism carbon dioxide in the blood:**
   a. forms carbonates
   b. stimulates the respiratory center of the medulla to increase the breathing rate
   c. accelerates the release of oxygen from hemoglobin
   d. is part of a buffer system
   e. all of the above

17. **Which of the following gas pressure situations would be correct for systemic tissue fluid before it receives blood:**
   a. PO₂ is 100 mm and PCO₂ is 40 mm
   b. PO₂ is 100 mm and PCO₂ is 46 mm
   c. PO₂ is 40 mm and PCO₂ is 40 mm
   d. PO₂ is 40 mm and PCO₂ is 46 mm
   e. PO₂ is 40 mm and PCO₂ is 100 mm

18. **The globin portion of hemoglobin binds with and carries:**
   a. CO₂
   b. CO
   c. O₂
   d. all of the above
   e. none of the above

19. **Carbon monoxide poisoning is due to:**
   a. its greater affinity for heme, which blocks O₂ from being transported
   b. direct, extreme depression of the breathing center
   c. an interaction with a blood salt, which produces an extreme acidity
   d. its inhibitory effects on the alveolar membrane diffusion channels for O₂
   e. unknown phenomena

20. **In the blood, carbon monoxide displaces O₂, forming:**
   a. bicarbonate ion
   b. heme
   c. carboxyhemoglobin
   d. carbamino acid
   e. oxyhemoglobin

21. **The heme portion of hemoglobin is responsible for:**
   a. carrying some CO₂
   b. stabilization of the entire molecule
   c. buffering blood pH
   d. carrying O₂
   e. no known function
22. The red color of the blood is caused by:
   a. Fe bonded to globin
   b. CO₂ bonded to heme
   c. free O₂ in the plasma
   d. oxyhemoglobin
   e. none of the above

23. The primary nerve center regulating breathing is in the:
   a. cerebellum
   b. medulla
   c. cerebrum
   d. pons
   e. superior colliculi

24. The neuronal groups of the medulla are timed (paced) by the:
   a. expiratory neurons
   b. apneustic center
   c. pneumotaxic center
   d. aortic baroreceptors
   e. cerebrum

25. A forced inspiration ends and expiration begins partly due to:
   a. the Hering-Breuer (lung) reflex
   b. inherent activity of the external intercostal muscles
   c. pneumothorax
   d. the carotid reflex
   e. the aortic baroreceptors

26. The inherent rhythmicity of breathing is produced by the:
   a. pneumotaxic center
   b. medullary dorsal group
   c. apneustic center
   d. Hering-Breuer reflex
   e. aortic and carotid bodies

27. Forced inspiration and expiration are caused by:
   a. medullary ventral group
   b. medullary dorsal group
   c. pneumotaxic center
   d. apneustic center
   e. vasomotor

28. Quiet inspiration is primarily caused by:
   a. apneustic center
   b. pneumotaxic center
   c. medullary ventral group
   d. medullary dorsal group
   e. vasomotor center
29. The breathing centers receive some input, directly or indirectly, regarding which of the following:
   a. blood pressure
   b. pH
   c. PO₂
   d. PCO₂
   e. all of the above

30. Faster or slower breathing would primarily be the responsibility of:
   a. dorsal group
   b. ventral group
   c. vasomotor center
   d. pneumotaxic center
   e. apneustic center

31. Ventilation will be increased by:
   a. increased blood acidity
   b. increased blood alkalinity
   c. increased blood oxygen
   d. decreased blood carbon dioxide
   e. bradypnea

32. Which of the following would cause bradypnea:
   a. elevated PO₂
   b. elevated PCO₂
   c. lowered PO₂
   d. elevated blood pH (meaning more acidic)
   e. both (or either) elevated PCO₂ and(or) lowered PO₂

33. Which of the following would cause a decrease in ventilation:
   a. increased carbon dioxide
   b. increased oxygen
   c. exercise
   d. pH increase (more acidic)
   e. all of the above

34. Ventilation will be decreased by:
   a. increased blood acidity
   b. increased blood oxygen
   c. increased blood carbon dioxide
   d. decreased blood oxygen
   e. none of the above

35. Ventilation will be increased because of:
   a. decreased blood CO₂
   b. increased blood CO₂
   c. increased blood O₂
   d. increased alveolar O₂
   e. decreased blood pH
36. Which of the following is not a sense organ concerned with some aspect of respiration:
   a. stretch receptor
   b. baroreceptor
   c. apneustic center
   d. aortic body
   e. carotid body

37. The Hering-Breuer (lung) reflex involves:
   a. stretch receptors in the lungs, which send inhibitory impulses to the brain to stop inspiration
   b. a feedback loop between the internal and external intercostal muscles, which will balance the timing of inspiration and expiration
   c. alveolar membrane control of the rate of gas exchange
   d. detection of the amount of blood O₂, CO₂ and pH, which is then communicated to the respiratory centers of the pons and medulla
   e. none of the above