Respiratory System Sample Questions

1. Surfactant
    a. reduces the interaction of water molecules in the fluid film in the alveoli.
    b. increases surface tension in the alveoli to aid in ventilation
    c. decreases the compliance of the lungs so that we are more efficient.
    d. is overproduced in premature infants.
    e. Two of the above are correct.

2. Alveolar ventilation
    a. is usually somewhat larger than minute ventilation.
    b. equals (breaths per minute) times (volume of air per breath).
    c. grows larger when dead space volume is the same as tidal volume.
    d. measures the volume of air entering the respiratory zone each minute.
    e. Two of the above are correct.

3. To begin a normal inspiration
    a. intrapulmonary pressure falls below atmospheric pressure.
    b. the volume of the chest cavity decreases.
    c. intrapleural pressure increases to allow air to enter lungs.
    d. a & b are correct
    e. all of the above are correct

4. As outside air flows into the conducting zone
    a. it is filtered, warmed and humidified.
    b. its carbon dioxide content increases and its oxygen content decreases.
    c. it flows from a region of lower pressure to a region of higher pressure.
    d. a & b are correct
    e. all of the above are correct

5. Air flow through the conducting zone
    a. increases when bronchiole smooth muscles relax.
    b. increases when bronchioles constrict.
    c. decreases when bronchiole smooth muscle relaxes.
    d. decreases when bronchioles dilate.
    e. Two of the above are correct.

6. Which of the following factors enhances gas exchange between alveoli and pulmonary capillaries?
    a. The large surface area of Type II alveoli.
    b. The nearness of capillaries to air.
    c. A layer of water inside the alveoli.
    d. a & b are correct
    d. all of the above are correct

7. For exhalation to begin which of the following must be true?
    a. Intrapleural pressure is greater that atmospheric pressure.
    b. Intrapulmonary pressure is greater than atmospheric pressure.
    c. Intrapleural pressure is greater that intrapulmonary pressure.
    d. Intrapulmonary pressure is less than atmospheric pressure.
    e. Two of the above are correct.

8. The lung capacity that is most directly related to intrapleural pressure is the
    a. tidal volume.
    b. vital capacity.
    c. residual volume.
    d. dead space.
    e. None of the above are correct.

9. The pressure gradient responsible for normal unforced expiration at rest is a result of
    a. contraction of smooth muscle in bronchioles.
    b. external intercostal muscle contraction.
    c. elastic recoil of tissues and surface tension.
    d. diaphragm relaxation.
    e. Two of the above are correct.

10. The amount of air that enters or leaves the lungs during a normal respiratory cycle is the:
    a. tidal volume.
    b. vital capacity.
    c. residual volume.
    d. dead space.
    e. None of the above are correct.

11. Identify the incorrect statement regarding pulmonary disorders.
    a. Pulmonary fibrosis is a restrictive disorder with decreased lung compliance.
    b. Emphysema is an obstructive disorder with increased lung compliance and decreased surface area for gas exchange.
    c. In obstructive disorders such as asthma, FEV_1 is decreased.
    d. Premature infants with respiratory distress syndrome can be given surfactant to increase their lung compliance.
    e. None of these statements are incorrect.

12. Charles takes his family from an area just above sea level to the mountains for a ski trip. He initially feels like it is more difficult to breathe at the higher altitude. A possible explanation for his difficulty might be that
    a. the partial pressure of O_2 is decreased due to lower atmospheric pressure.
    b. the % oxygen in the mixture of gases is decreased at the higher elevation.
    c. it is physically harder to change intrapulmonary pressure at higher altitudes.
    d. the partial pressure of CO_2 is increased due to pollution.
    e. Two of the above are correct.

13. To some degree, the peripheral chemoreceptors in the carotid arteries and aortic arch are measuring
    a. blood carbon dioxide concentration.
    b. blood hydrogen ion concentration.
    c. blood oxygen concentration.
    d. a & b are correct
    e. all of the above are correct

14. During exercise
    a. expiration is passive.
    b. inspiration is passive.
    c. expiration is assisted by intercostal and abdominal muscles.
    d. inspiration is assisted by intercostal and abdominal muscles.
    e. Two of the above are correct.

15. Intrapleural pressure
    a. is always positive.
    b. is always negative.
    c. changes from positive to negative during inspiration.
    d. changes from positive to negative during expiration.

16. Areas that can modulate the rate and depth of breathing are located in the
    a. medulla oblongata.
    b. pons.
    c. cerebral cortex.
    d. carotid arteries.
    e. Two of the above are correct.

17. Suppose, in a healthy person, the P_{CO2} in alveoli is 50 mm Hg. It follows that
    a. respiration rate will increase to decrease blood pH.
    b. the P_{O2} in the blood will determine whether respiration rate increases.
    c. respiratory acidosis is most likely occurring.
    d. the pneumotaxic area will decrease the frequency of inspiratory neuron activity.
    e. Two of the above are correct.

18. The apneuistic center
    a. modulates breathing rate.
    b. modulates depth of breathing.
    c. modulates the amount of O_2 exchanged in the alveoli.
    d. is also known as the rhythmicity center.
    e. Two of the above are correct.

19. Small changes in P_{O2} lead to
    a. large changes in breathing rate.
    b. large changes in breathing depth.
    c. an increase in chemoreceptor sensitivity.
    d. no significant respiratory changes.

20. Of the following factors, an increase in breathing rate is tied most closely to
    a. a slight rise in the level of bicarbonate ions.
    b. a slight rise in the level of carbon dioxide.
    c. a slight decrease in the level of carbon dioxide.
    d. a slight fall in the level of oxygen.
    e. Two of the above are correct.

ANSWERS

1. a	11. e
2. d	12. a
3. a	13. e
4. d	14. c
5. a	15. b
6. b	16. e (b & c)
7. b	17. c
8. c	18. b
9. d	19. d
10. a	20. b