

Exercises

1) Which of the following statements is false?

- A- In the tissues, PO₂ drops as blood passes from the arteries to the veins, while PCO₂ increases.
- B- Blood travels from the lungs to the heart to body tissues, then back to the heart, then the lungs.
- C- Blood travels from the lungs to the heart to body tissues, then back to the lungs, then the heart.
- D- PO₂ is higher in air than in the lungs.

2) The inspiratory reserve volume measures the _____.

- A- amount of air remaining in the lung after a maximal exhalation
- B- amount of air that the lung holds
- C- amount of air that can be further exhaled after a normal breath
- D- amount of air that can be further inhaled after a normal breath

3) Of the following, which does not explain why the partial pressure of oxygen is lower in the lung than in the external air?

- A- Air in the lung is humidified; therefore, water vapor pressure alters the pressure.
- B- Carbon dioxide mixes with oxygen.
- C- Oxygen is moved into the blood and is headed to the tissues.
- D- Lungs exert a pressure on the air to reduce the oxygen pressure.

4) The total lung capacity is calculated using which of the following formulas?

- A- residual volume + tidal volume + inspiratory reserve volume
- B- residual volume + expiratory reserve volume + inspiratory reserve volume
- C- expiratory reserve volume + tidal volume + inspiratory reserve volume
- D- residual volume + expiratory reserve volume + tidal volume + inspiratory reserve volume

5) What does FEV₁/FVC measure? What factors may affect FEV₁/FVC?

6) What is the reason for having residual volume in the lung?

7) How can a decrease in the percent of oxygen in the air affect the movement of oxygen in the body?

8) If a patient has increased resistance in his or her lungs, how can this be detected by a doctor? What does this mean?

**Answers

1)C

2)D

3)D

4)D

5)FEV₁/FVC measures the forced expiratory volume in one second in relation to the total forced vital capacity (the total amount of air that is exhaled from the lung from a maximal inhalation). This ratio changes with alterations in lung function that arise from diseases such as fibrosis, asthma, and COPD.

6)If all the air in the lung were exhaled, then opening the alveoli for the next inspiration would be very difficult. This is because the tissues would stick together.

7)Oxygen moves from the lung to the bloodstream to the tissues according to the pressure gradient. This is measured as the partial pressure of oxygen. If the amount of oxygen drops in the inspired air, there would be reduced partial pressure. This would decrease the driving force that moves the oxygen into the blood and into the tissues.

PO₂ is also reduced at high elevations:

PO₂ at high elevations is lower than at sea level because the total atmospheric pressure is less than atmospheric pressure at sea level.

8)A doctor can detect a restrictive disease using spirometry. By detecting the rate at which air can be expelled from the lung, a diagnosis of fibrosis or another restrictive disease can be made.