

PHYSIOLOGY – RESPIRATORY SYSTEM 2 PRACTICE TEST (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

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<https://physiorespiratorysys2.examzify.com>



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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. Which pulmonary function change is commonly associated with emphysema?**
 - A. Decreased TLC
 - B. Increased Residual Volume
 - C. Decreased FEV1
 - D. Increased Diffusing Capacity
- 2. During forced expiration, equal pressure point moves closer to mouth and FEV increases if there is an increase in which?**
 - A. Inspired lung volume
 - B. Lung compliance
 - C. Airway resistance
 - D. Expiratory effort
- 3. Which statement best describes Residual Volume (RV)?**
 - A. Air left in the lungs after a normal exhale
 - B. The total amount of air the lungs can hold
 - C. The air exhaled in the first second of forced expiration
 - D. The air left in the lungs after a maximal exhalation
- 4. Which statement about physiological dead space is true?**
 - A. It equals the sum of anatomical dead space and alveolar dead space
 - B. It always equals the anatomical dead space
 - C. It is independent of perfusion
 - D. It is the air in the lungs not reaching the alveoli
- 5. Alveolar pressure during inspiration relative to atmospheric is:**
 - A. Higher than atmospheric
 - B. Equal to atmospheric
 - C. Lower than atmospheric
 - D. Much higher

- 6. Hypoxic pulmonary vasoconstriction at high altitude leads to which effect?**
- A. Pulmonary vasoconstriction
 - B. Pulmonary vasodilation
 - C. Systemic vasodilation
 - D. Right-to-left shunt
- 7. In a healthy person, alveolar CO₂ concentration is highest in alveoli at the end of expiration. Which of the following best expresses this?**
- A. End Expiration Alveoli
 - B. End Inspiration Alveoli
 - C. End Inspiration Dead Space
 - D. End Expiration Dead Space
- 8. Which of the following conditions will cause a decrease in pulmonary vascular resistance?**
- A. Inflation of the lungs to total lung capacity
 - B. Increased cardiac output
 - C. Alveolar hypoxia
 - D. Decreased pH in the pulmonary artery
- 9. Which condition causes hypoxemia that is not fully corrected by 100% oxygen due to shunting?**
- A. COPD
 - B. Right-to-left shunt
 - C. Anemia
 - D. Diffusion impairment
- 10. Increasing the tidal volume while keeping everything else constant increases the...**
- A. Dead Space Ventilation
 - B. Functional Residual Capacity
 - C. Inspiratory Capacity
 - D. Alveolar Ventilation

Answers

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1. C
2. A
3. D
4. A
5. C
6. A
7. A
8. B
9. C
10. D

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Explanations

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1. Which pulmonary function change is commonly associated with emphysema?

- A. Decreased TLC
- B. Increased Residual Volume
- C. Decreased FEV1**
- D. Increased Diffusing Capacity

Emphysema creates obstruction of the small airways because of loss of elastic recoil and destruction of alveolar walls, so air is not expelled efficiently. This reduces the rate of expiration, making the forced expiratory volume in one second (FEV1) fall. FEV1 is a direct measure of how quickly you can blow out air, and in obstructive diseases like emphysema it decreases markedly, often with a reduced FEV1/FVC ratio as well. While air trapping can raise residual volume and hyperinflation can increase total lung capacity, the most characteristic and consistently observed change among the options is the decreased FEV1.

2. During forced expiration, equal pressure point moves closer to mouth and FEV increases if there is an increase in which?

- A. Inspired lung volume**
- B. Lung compliance
- C. Airway resistance
- D. Expiratory effort

Starting from a larger inspiratory lung volume means the lungs are more expanded when you begin forced expiration. This greater stretch increases the elastic recoil of the lungs and chest wall, which provides a stronger driving pressure pushing air out. At the same time, the inflated lungs pull the airways open more due to radial traction, reducing airway resistance early in expiration. Together, these effects raise the peak expiratory flow and the amount of air you can forcefully exhale, so the Forced Expiratory Volume rises. The equal pressure point, the location where airway pressure equals surrounding pleural pressure and dynamic airway collapse begins, shifts in a way consistent with this increased recoil and openness of the airways, moving closer to the mouth as expiration proceeds.

3. Which statement best describes Residual Volume (RV)?

- A. Air left in the lungs after a normal exhale
- B. The total amount of air the lungs can hold
- C. The air exhaled in the first second of forced expiration
- D. The air left in the lungs after a maximal exhalation**

Residual volume is the amount of air left in the lungs after a maximal exhalation. This constant reservoir keeps some gas in the lungs to prevent collapse and to support gas exchange between breaths. It is not the air remaining after a normal exhale—that would be the functional residual capacity—nor the total air the lungs can hold (total lung capacity). It isn't the air exhaled in the first second of a forced expiration (that measure is FEV1). In healthy adults, RV is about 1.2 liters for men and somewhat less for women, and it's typically measured with methods like body plethysmography or gas dilution because spirometry alone can't remove all the air from the lungs.

4. Which statement about physiological dead space is true?

- A. It equals the sum of anatomical dead space and alveolar dead space
- B. It always equals the anatomical dead space
- C. It is independent of perfusion
- D. It is the air in the lungs not reaching the alveoli

Physiological dead space is the portion of each breath that does not participate in gas exchange. It includes air in the conducting airways (anatomical dead space) and air in ventilated but nonperfused alveoli (alveolar dead space). Therefore, physiological dead space equals the sum of anatomical dead space and alveolar dead space. In healthy lungs alveolar dead space is small, so physiological dead space approximates anatomical dead space. The alveolar component increases when perfusion to some alveoli is reduced, raising the physiological dead space. It isn't just air in the lungs not reaching alveoli (that would be anatomical dead space alone), and it depends on perfusion, since alveolar dead space arises from mismatches between ventilation and perfusion.

5. Alveolar pressure during inspiration relative to atmospheric is:

- A. Higher than atmospheric
- B. Equal to atmospheric
- C. Lower than atmospheric
- D. Much higher

During inspiration the chest expands as the diaphragm and external intercostals contract, increasing the volume of the thoracic cavity. This expansion lowers the alveolar (intrapulmonary) pressure below the surrounding atmospheric pressure. Air then flows into the lungs to equalize the pressure, so the alveolar pressure is temporarily subatmospheric (a small negative pressure, around -1 to -2 cm H₂O). It returns to atmospheric as flow ceases and inspiration ends. That makes the correct description: alveolar pressure is lower than atmospheric during inspiration.

6. Hypoxic pulmonary vasoconstriction at high altitude leads to which effect?

- A. Pulmonary vasoconstriction
- B. Pulmonary vasodilation
- C. Systemic vasodilation
- D. Right-to-left shunt

Hypoxic pulmonary vasoconstriction is a local response of the pulmonary arteries to low oxygen levels in the alveoli. At high altitude, reduced alveolar PO₂ triggers constriction of small pulmonary vessels, which serves to divert blood away from poorly ventilated regions toward better-ventilated areas and improve ventilation-perfusion matching. The immediate result of this pulmonary-specific response is pulmonary vasoconstriction, which raises pulmonary vascular resistance and the pressure the right ventricle must pump against. Mechanistically, hypoxia causes smooth muscle cells in the pulmonary arteries to decrease potassium conductance, leading to depolarization, opening of voltage-gated calcium channels, and calcium influx that promotes contraction. While this helps optimize gas exchange, widespread vasoconstriction increases right heart workload and can contribute to high-altitude complications such as edema in susceptible individuals. It's not a systemic vasodilatory effect, and a right-to-left shunt is not the direct outcome of this mechanism (though severe pulmonary hypertension can influence shunting if there are intracardiac defects).

7. In a healthy person, alveolar CO₂ concentration is highest in alveoli at the end of expiration. Which of the following best expresses this?

- A. End Expiration Alveoli
- B. End Inspiration Alveoli
- C. End Inspiration Dead Space
- D. End Expiration Dead Space

The main idea is how alveolar gas composition changes during the breathing cycle. CO₂ in the alveoli is highest at the end of expiration because, as air leaves the lungs, CO₂-rich alveolar gas remains until the next breath dilutes it. When inspiration begins, fresh air with little CO₂ is drawn in, lowering the alveolar CO₂ concentration. The end of expiration represents the moment when the alveolar gas is most enriched in CO₂ before the next influx of fresh air. Dead space air or air at the end of inspiration doesn't reflect the peak alveolar CO₂ in the same way, so they aren't the best expressions of the concept.

8. Which of the following conditions will cause a decrease in pulmonary vascular resistance?

- A. Inflation of the lungs to total lung capacity
- B. Increased cardiac output
- C. Alveolar hypoxia
- D. Decreased pH in the pulmonary artery

Pulmonary vascular resistance falls when more pulmonary vessels participate in blood flow and when those vessels are distended by higher flow. Increasing cardiac output boosts flow through the lungs, which recruits additional capillaries and stretches the vessels, lowering the overall resistance the right ventricle has to overcome. The other factors tend to raise resistance: inflating the lungs to very high volumes can compress vessels; alveolar hypoxia triggers vasoconstriction in the pulmonary circulation; and a drop in pH (acidemia) also causes pulmonary vasoconstriction. So the condition that decreases pulmonary vascular resistance is increased cardiac output.

9. Which condition causes hypoxemia that is not fully corrected by 100% oxygen due to shunting?

- A. COPD
- B. Right-to-left shunt
- C. Anemia
- D. Diffusion impairment

The key idea is that some hypoxemia cannot be corrected by breathing pure oxygen when blood bypasses the lungs' gas-exchanging units. A right-to-left shunt provides exactly that scenario: a portion of venous blood returns to the arterial circulation without being oxygenated because it bypasses ventilated alveoli. Because this deoxygenated blood mixes with oxygenated blood, the arterial PO₂ stays low even with 100% inspired O₂, and the alveolar-arterial gradient remains increased. Other problems like COPD or diffusion impairment involve parts of the lung still ventilated and capable of gas exchange, so higher oxygen can improve the arterial PO₂, though not always to normal levels. Anemia lowers the oxygen content of blood (CaO₂) by reducing hemoglobin or its carrying capacity, but arterial PO₂ can be normal because the lungs may still oxygenate the blood; giving more O₂ doesn't fix the Hb quantity. Thus, the situation described—hypoxemia that isn't fully corrected by 100% oxygen due to shunting—points to a right-to-left shunt.

10. Increasing the tidal volume while keeping everything else constant increases the...

- A. Dead Space Ventilation
- B. Functional Residual Capacity
- C. Inspiratory Capacity
- D. Alveolar Ventilation**

The main idea is how alveolar ventilation changes when you take deeper breaths while other factors stay the same. Alveolar ventilation is the portion of each breath that actually reaches the gas-exchanging units, and it is calculated as (tidal volume minus dead space) times the number of breaths per minute. If you increase tidal volume and keep dead space and breathing rate constant, more air per breath gets to the alveoli. That means alveolar ventilation increases because you're delivering more fresh air to the gas-exchanging units with each breath. Dead space ventilation depends on the fixed dead space volume and the breathing rate, so simply deepening breaths doesn't change that portion. Functional residual capacity and inspiratory capacity are determined by static lung volumes; changing breath depth without altering end-expiratory volumes doesn't raise these capacities. So the only parameter that rises with deeper breathing, when other factors are held constant, is alveolar ventilation.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://physiorespiratorysys2.examzify.com>

We wish you the very best on your exam journey. You've got this!

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