

# University of Central Florida (UCF) PCB3703C Human Physiology Exam 4 Practice (Sample)

## Study Guide



**Everything you need from our exam experts!**

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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

- 1. Type one cells in the alveoli are primarily responsible for?**
  - A. Oxygen exchange**
  - B. Humidity control**
  - C. Carbon dioxide regulation**
  - D. Production of surfactant**
  
- 2. Which cause of hypoxia is characterized by decreased arterial PO<sub>2</sub> and increased A-a gradient?**
  - A. Hypoventilation**
  - B. Right-to-Left cardiac shunt**
  - C. Pulmonary embolism**
  - D. Altitude sickness**
  
- 3. What is the primary role of tonic contractions in the GI tract?**
  - A. Move food through the GI tract**
  - B. Sustain pressure in particular segments**
  - C. Relax the lower esophageal sphincter**
  - D. Enhance nutrient absorption**
  
- 4. The muscular layer of the GI tract consists of what types of muscle?**
  - A. Cardiac and smooth muscle**
  - B. Striated and cardiac muscle**
  - C. Circular and longitudinal muscle**
  - D. Only smooth muscle**
  
- 5. What condition is indicated by gastric reflux in the esophagus?**
  - A. Achalasia**
  - B. Esophagitis**
  - C. Esophageal atresia**
  - D. Tracheoesophageal fistula**

- 6. What causes the deficiency of intrinsic factor leading to anemia?**
- A. Chronic blood loss**
  - B. Malnutrition**
  - C. Removal of part of the stomach**
  - D. Vitamin D deficiency**
- 7. What physiological reaction occurs in response to hypoxia in the lungs?**
- A. Vasodilation of affected areas**
  - B. Vasoconstriction to block affected areas**
  - C. Increased blood flow to affected areas**
  - D. Reduction of gas exchange**
- 8. Which drug acts as an H<sub>2</sub>-receptor antagonist in the treatment of Zollinger-Ellison syndrome?**
- A. Atropine**
  - B. Omeprazole**
  - C. Cimetidine**
  - D. Ranitidine**
- 9. What symptom would most likely indicate cirrhosis in a patient?**
- A. Persistent cough**
  - B. Fluid retention in the abdomen**
  - C. Severe headache**
  - D. Frequent infections**
- 10. What is the effect of gastric mucosa hypertrophy on the body?**
- A. Improved digestion**
  - B. Increased risk of tumors**
  - C. Enhanced nutrient absorption**
  - D. Reduced gastric acid production**



## **Answers**

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

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## **Explanations**

**1. Type one cells in the alveoli are primarily responsible for?**

- A. Oxygen exchange**
- B. Humidity control**
- C. Carbon dioxide regulation**
- D. Production of surfactant**

Type one cells in the alveoli, also known as type I alveolar cells, primarily facilitate oxygen exchange within the lungs. They are flat, thin cells that form the structure of the alveolar walls, providing a large surface area for gas exchange between the alveoli and the blood in the capillaries. Their morphology allows for efficient diffusion of oxygen from the alveoli into the bloodstream and of carbon dioxide from the blood into the alveoli. While the other options include important functions related to lung physiology, they are not primarily the role of type one cells. For example, type II alveolar cells are responsible for the production of surfactant, which reduces surface tension in the alveoli and prevents collapse during exhalation. Similarly, humidity control and carbon dioxide regulation in the lungs involve other mechanisms and structures, indicating that type one cells are specifically specialized for oxygen exchange.

**2. Which cause of hypoxia is characterized by decreased arterial PO<sub>2</sub> and increased A-a gradient?**

- A. Hypoventilation**
- B. Right-to-Left cardiac shunt**
- C. Pulmonary embolism**
- D. Altitude sickness**

The correct answer, which describes a cause of hypoxia characterized by decreased arterial PO<sub>2</sub> and an increased A-a gradient, is associated with a right-to-left cardiac shunt. In this condition, blood bypasses the lungs and does not get adequately oxygenated before entering the systemic circulation. This leads to lower levels of oxygen in the arterial blood (decreased arterial PO<sub>2</sub>) because some of the deoxygenated blood from the right side of the heart is mixing with oxygenated blood from the left side without passing through the lungs. The A-a gradient, which refers to the difference between the alveolar oxygen concentration and the arterial oxygen concentration, is increased in this scenario because while the alveolar oxygen levels may be normal, the arterial oxygen levels are significantly reduced due to the shunting. This discrepancy indicates that there is a problem with oxygenation, as the lungs are not able to oxygenate the blood effectively due to the bypass. In contexts like hypoventilation, pulmonary embolism, and altitude sickness, while there may be decreased arterial PO<sub>2</sub>, they do not specifically lead to an increased A-a gradient in the same way that right-to-left shunting does, as those conditions typically involve issues directly related to ventilation-perfusion matching or overall oxygen

**3. What is the primary role of tonic contractions in the GI tract?**

- A. Move food through the GI tract**
- B. Sustain pressure in particular segments**
- C. Relax the lower esophageal sphincter**
- D. Enhance nutrient absorption**

The primary role of tonic contractions in the gastrointestinal (GI) tract is to sustain pressure in particular segments. These contractions are characterized by their long duration and low intensity, creating a continuous contraction that helps maintain a certain level of tension in the muscular walls of specific segments of the GI tract. This sustained pressure is essential for functions such as holding food in place, preventing backflow of contents, and regulating the flow of materials through the digestive system. For instance, tonic contractions are important in areas like the lower esophageal sphincter, where maintaining pressure is crucial to prevent reflux. Unlike other types of contractions, which are more about moving food along the tract, tonic contractions provide the necessary support and pressure to ensure the proper functioning of the GI system.

**4. The muscular layer of the GI tract consists of what types of muscle?**

- A. Cardiac and smooth muscle**
- B. Striated and cardiac muscle**
- C. Circular and longitudinal muscle**
- D. Only smooth muscle**

The muscular layer of the gastrointestinal (GI) tract primarily consists of two distinct types of muscle: circular and longitudinal muscle. These muscle layers work together to facilitate the movement of food through the digestive system via a process known as peristalsis. The circular muscle layer constricts the lumen of the GI tract, which helps to propel contents forward. Meanwhile, the longitudinal muscle layer shortens the segment of the tract, allowing for the coordinated contraction and relaxation cycles necessary for effective movement and mixing of food. This arrangement also contributes to the segmentation movements that help enhance digestion and absorption. While it's true that smooth muscle is the primary muscle type found in the gastrointestinal tract, it's the specific functional arrangements of the circular and longitudinal muscle layers that are critical for the GI tract's motor activity. Other muscle types, such as cardiac muscle, are found in the heart, and skeletal muscle is present in voluntary muscles, but neither is involved in the muscular layer of the GI tract.

**5. What condition is indicated by gastric reflux in the esophagus?**

- A. Achalasia**
- B. Esophagitis**
- C. Esophageal atresia**
- D. Tracheoesophageal fistula**

Gastric reflux in the esophagus is primarily associated with esophagitis, which is the inflammation of the esophagus. This condition arises when stomach acid flows back into the esophagus, leading to irritation and inflammation of the esophageal lining. The reflux can cause symptoms such as heartburn, chest pain, and difficulty swallowing. In the context of esophagitis, the inflammation can be due to various factors, including the chronic exposure to gastric acid due to conditions like gastroesophageal reflux disease (GERD). This condition is characterized by the repeated backflow of stomach contents into the esophagus, exacerbating irritation and leading to further symptoms and complications if left untreated. Other conditions listed, such as achalasia, esophageal atresia, and tracheoesophageal fistula, involve structural or functional abnormalities of the esophagus rather than the inflammatory response caused by gastric reflux. These alternatives do not fit the indication of gastric reflux leading to inflammation of the esophagus as effectively as esophagitis does. Thus, esophagitis directly addresses the scenario described regarding gastric reflux.

**6. What causes the deficiency of intrinsic factor leading to anemia?**

- A. Chronic blood loss**
- B. Malnutrition**
- C. Removal of part of the stomach**
- D. Vitamin D deficiency**

The deficiency of intrinsic factor, which leads to anemia, is primarily due to the removal of part of the stomach. Intrinsic factor is a glycoprotein produced by the parietal cells of the stomach that is essential for the absorption of vitamin B12 in the intestines. Vitamin B12 is crucial for red blood cell production and DNA synthesis. If a portion of the stomach is surgically removed, such as in a gastrectomy, the production of intrinsic factor may be significantly decreased or eliminated, leading to an inability to absorb sufficient vitamin B12. This deficiency can result in a type of anemia known as pernicious anemia, characterized by macrocytic red blood cells due to inadequate vitamin B12 levels. In contrast, chronic blood loss primarily results in iron deficiency anemia due to a lack of iron needed for hemoglobin synthesis. Malnutrition can contribute to various types of anemia but does not specifically target intrinsic factor. Vitamin D deficiency affects calcium metabolism and bone health but does not directly influence the production of intrinsic factor or the absorption of vitamin B12.

**7. What physiological reaction occurs in response to hypoxia in the lungs?**

- A. Vasodilation of affected areas**
- B. Vasoconstriction to block affected areas**
- C. Increased blood flow to affected areas**
- D. Reduction of gas exchange**

Hypoxia, or low oxygen levels, triggers a specific physiological response in the lungs known as hypoxic pulmonary vasoconstriction. This mechanism is particularly crucial for optimizing gas exchange. When an area of the lung is poorly ventilated and experiences low oxygen levels, the blood vessels in that area constrict. This vasoconstriction redirects blood flow away from the hypoxic regions toward better-ventilated areas of the lung where oxygen levels are higher. By doing so, the body enhances overall oxygen uptake and maintains effective gas exchange, ultimately protecting against the negative effects of inadequate oxygen delivery to the tissues. Therefore, the action of vasoconstricting blood vessels in response to hypoxia is a protective physiological mechanism to improve oxygenation in the lungs. In contrast, if there were vasodilation or increased blood flow to the hypoxic areas, it would worsen the situation by encouraging blood to flow through regions that are not effectively exchanging gases, leading to even more pronounced hypoxia and inefficiency in oxygen delivery.

**8. Which drug acts as an H<sub>2</sub>-receptor antagonist in the treatment of Zollinger-Ellison syndrome?**

- A. Atropine**
- B. Omeprazole**
- C. Cimetidine**
- D. Ranitidine**

Cimetidine is classified as an H<sub>2</sub>-receptor antagonist, which specifically targets the histamine H<sub>2</sub> receptors in the stomach lining. By blocking these receptors, cimetidine effectively reduces the secretion of gastric acid, making it useful in treating conditions characterized by excessive acid production, such as Zollinger-Ellison syndrome. In Zollinger-Ellison syndrome, gastrin-secreting tumors cause an overproduction of gastric acid, leading to severe ulcers and related gastrointestinal symptoms. By inhibiting the action of histamine on the H<sub>2</sub> receptors, cimetidine helps to lower acid secretion and manage the symptoms associated with this syndrome. While other options like omeprazole are also involved in reducing gastric acid, they function via a different mechanism by inhibiting the proton pump in the stomach rather than targeting H<sub>2</sub> receptors directly. Atropine, on the other hand, is an anticholinergic medication that reduces gastric secretions but isn't an H<sub>2</sub>-receptor antagonist. Ranitidine is another H<sub>2</sub>-receptor antagonist similar to cimetidine, but cimetidine is the more classically recognized drug for this specific query regarding Zollinger-Ellison syndrome.

**9. What symptom would most likely indicate cirrhosis in a patient?**

- A. Persistent cough**
- B. Fluid retention in the abdomen**
- C. Severe headache**
- D. Frequent infections**

Fluid retention in the abdomen, known as ascites, is a common symptom associated with cirrhosis. Cirrhosis is the scarring of the liver resulting from various liver diseases, and it can lead to increased pressure in the blood vessels of the liver. This increased pressure causes fluid to leak into the abdominal cavity, resulting in swelling. Additionally, as the liver function declines, it may not produce enough albumin, a protein that helps maintain fluid balance in the blood, further contributing to fluid retention. This symptom often accompanies other signs of liver dysfunction, such as jaundice (yellowing of the skin and eyes) and easy bruising or bleeding due to impaired synthesis of clotting factors. Understanding these clinical manifestations is crucial for diagnosing and managing chronic liver conditions effectively.

**10. What is the effect of gastric mucosa hypertrophy on the body?**

- A. Improved digestion**
- B. Increased risk of tumors**
- C. Enhanced nutrient absorption**
- D. Reduced gastric acid production**

Gastric mucosa hypertrophy refers to the thickening of the gastric mucosa, which is the lining of the stomach. This condition can lead to various pathophysiological changes. One significant concern associated with gastric mucosa hypertrophy is an increased risk of tumors, particularly gastric cancer. The thickened mucosa can become a site of dysplasia or other cellular changes that predispose individuals to malignancy. Additionally, the hypertrophied gastric mucosa may produce more gastric secretions, which could create an environment conducive to abnormal cellular changes. Moreover, long-term irritants or inflammation associated with hypertrophy can further elevate cancer risk. Therefore, while there might be some initial benefits like improved mucosa protection or digestion, the overriding concern is the long-term potential for tumor development in the presence of sustained gastric mucosa hypertrophy.



## 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](mailto:hello@examzify.com).**

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

**<https://ucf-pcb3703c-exam4.examzify.com>**

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