

NBEO General Physiology Practice Exam (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

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- 1. Antidiuretic hormone (ADH) primarily acts on which area of the nephron?**
 - A. Proximal Convoluted Tubule**
 - B. Descending Loop of Henle**
 - C. Ascending Loop of Henle**
 - D. Collecting Duct**

- 2. During muscle contraction, which band remains the same length?**
 - A. I band**
 - B. A band**
 - C. Z band**
 - D. H band**

- 3. What valve is responsible for separating the left atrium and left ventricle?**
 - A. Tricuspid valve**
 - B. Pulmonary valve**
 - C. Aortic valve**
 - D. Mitral valve**

- 4. Which heart sound could potentially indicate hypertrophic ventricles?**
 - A. S1**
 - B. S2**
 - C. S3**
 - D. S4**

- 5. What type of hormones are produced in the adrenal medulla?**
 - A. Corticosteroids**
 - B. Mineralocorticoids**
 - C. Catecholamines**
 - D. Progestins**

- 6. What phase does Days 14-28 of the menstrual cycle represent?**
- A. Follicular phase**
 - B. Luteal phase**
 - C. Proliferative phase**
 - D. Secretory phase**
- 7. Which specialized cells in the kidney are responsible for producing renin?**
- A. Podocytes**
 - B. Macula Densa Cells**
 - C. Juxtaglomerular Cells**
 - D. Mesangial Cells**
- 8. Which of the following decreases stroke volume and contractility?**
- A. Heart failure**
 - B. Myocardial infarction**
 - C. Acidosis**
 - D. All of the above**
- 9. What type of breathing is characterized by the contraction of the abdominal muscles?**
- A. Normal breathing**
 - B. Forced inspiration**
 - C. Forced expiration**
 - D. Sighing**
- 10. Which gas has a higher concentration in the bloodstream compared to its concentration in the lungs?**
- A. Oxygen**
 - B. Carbon Dioxide**
 - C. Both gases are equal**
 - D. Nitrogen**

Answers

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

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Explanations

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1. Antidiuretic hormone (ADH) primarily acts on which area of the nephron?

- A. Proximal Convolted Tubule**
- B. Descending Loop of Henle**
- C. Ascending Loop of Henle**
- D. Collecting Duct**

Antidiuretic hormone (ADH), also known as vasopressin, plays a crucial role in the regulation of water balance in the body by primarily acting on the collecting duct of the nephron. When ADH is released from the posterior pituitary gland in response to high plasma osmolality or low blood volume, it promotes the insertion of aquaporin-2 water channels into the cell membranes of the collecting duct's principal cells. This insertion of aquaporins allows water to be reabsorbed back into the bloodstream, leading to concentrated urine and a decrease in urine volume. The action of ADH significantly affects the body's ability to maintain osmotic balance and prevent dehydration. By increasing the permeability of the collecting duct to water, ADH effectively enhances water reabsorption, demonstrating its critical function in the renal system. The roles of other segments of the nephron are different. For instance, the proximal convoluted tubule is primarily responsible for the reabsorption of sodium, chloride, and water, while the loops of Henle are involved in the concentration of urine and creating a gradient in the renal medulla. Thus, the specific action of ADH on the collecting duct makes it the correct answer for this question.

2. During muscle contraction, which band remains the same length?

- A. I band**
- B. A band**
- C. Z band**
- D. H band**

The A band remains the same length during muscle contraction. The A band is composed of thick filaments (myosin) and overlaps with thin filaments (actin), and it corresponds to the length of these thick filaments. During contraction, the actin filaments slide over the myosin filaments, which leads to a shortening of the sarcomere, but the length of the thick filaments (and thus the A band) does not change. In contrast, the I band, which contains only thin filaments, decreases in length as the muscle contracts; the H band, which is the region where thin filaments do not overlap with thick filaments, also diminishes in size. The Z line, which is the boundary between adjacent sarcomeres, moves closer together during contraction, further emphasizing that the regions outside the A band change in length. Therefore, the property of the A band remaining constant during contraction is essential for understanding the mechanics of muscle function.

3. What valve is responsible for separating the left atrium and left ventricle?

- A. Tricuspid valve**
- B. Pulmonary valve**
- C. Aortic valve**
- D. Mitral valve**

The valve that separates the left atrium and the left ventricle is the mitral valve. Anatomically, the mitral valve is distinct because it consists of two cusps, earning it the alternative name "bicuspid valve." Its primary role is to allow blood to flow from the left atrium into the left ventricle while preventing backflow during ventricular contraction. This function is crucial for maintaining efficient blood circulation throughout the body, as it ensures that oxygenated blood efficiently enters the left ventricle to be pumped into the aorta for distribution to the tissues. The other valves mentioned serve different functions within the heart. For instance, the tricuspid valve is located between the right atrium and right ventricle, the pulmonary valve is found between the right ventricle and the pulmonary artery, and the aortic valve is situated between the left ventricle and the aorta. Each of these valves plays significant roles in the flow of blood through the heart and to the lungs or the rest of the body, but they do not separate the left atrium from the left ventricle. Therefore, the mitral valve is specifically responsible for this separation and the proper functioning of the left heart chambers.

4. Which heart sound could potentially indicate hypertrophic ventricles?

- A. S1**
- B. S2**
- C. S3**
- D. S4**

The fourth heart sound, or S4, is associated with conditions that cause increased resistance to filling the ventricles, such as hypertrophic cardiomyopathy. In individuals with hypertrophic ventricles, the thickened heart muscle can lead to a decrease in the ventricular chamber size and an increase in stiffness. This stiffness means that the heart requires more forceful contractions to fill effectively, which often results in the S4 sound being generated during the late diastolic phase when the atria contract to push blood into the stiff ventricle. S4 is referred to as an "Atrial Gallop" because it occurs just before S1, caused by vibrations from the atrial contraction against a non-compliant ventricle. This sound is particularly prominent in patients with conditions like hypertension and aortic stenosis, as well as prominently in those with hypertrophic cardiomyopathy. Understanding the significance of S4 can provide invaluable insight into the underlying heart mechanics and structural changes that might be occurring, making it a key clinical finding in assessing patients with possible hypertrophied cardiac ventricles.

5. What type of hormones are produced in the adrenal medulla?

- A. Corticosteroids**
- B. Mineralocorticoids**
- C. Catecholamines**
- D. Progestins**

The adrenal medulla is responsible for producing catecholamines, which include hormones such as epinephrine (adrenaline) and norepinephrine (noradrenaline). These hormones are crucial for the body's response to stress, as they are involved in the "fight or flight" response. When stressors are encountered, catecholamines are released into the bloodstream, leading to several physiological changes, such as increased heart rate, elevated blood pressure, and enhanced energy availability. This response prepares the body to react quickly to potential threats. In contrast, corticosteroids are produced in the adrenal cortex, not the medulla. Mineralocorticoids, such as aldosterone, also originate from the adrenal cortex and are primarily involved in the regulation of electrolyte balance and blood pressure. Progestins, like progesterone, are a different class of hormones primarily associated with reproductive functions and are produced in the ovaries, placenta, and adrenal cortex. Understanding these distinctions highlights the unique roles of different hormones in the body's physiology, and how the adrenal medulla specifically focuses on quick, stress-related hormone production through catecholamines.

6. What phase does Days 14-28 of the menstrual cycle represent?

- A. Follicular phase**
- B. Luteal phase**
- C. Proliferative phase**
- D. Secretory phase**

Days 14-28 of the menstrual cycle represent the luteal phase, which is characterized by the presence of the corpus luteum, a structure formed from the follicle after ovulation. During this phase, the corpus luteum secretes progesterone and estrogen, hormones that prepare the endometrium for a potential implantation of a fertilized egg. If fertilization does not occur, the corpus luteum degenerates, leading to a decrease in hormone levels, which ultimately triggers menstruation. The luteal phase typically lasts around 14 days and is crucial for establishing a supportive environment for a possible pregnancy. In contrast, the follicular phase occurs earlier in the cycle, leading up to ovulation, while the proliferative and secretory phases refer more specifically to changes in the endometrium associated with estrogen and progesterone levels, respectively.

7. Which specialized cells in the kidney are responsible for producing renin?

- A. Podocytes**
- B. Macula Densa Cells**
- C. Juxtaglomerular Cells**
- D. Mesangial Cells**

The correct answer is the juxtaglomerular cells. These specialized smooth muscle cells are located in the walls of the afferent arterioles leading into the glomeruli of the kidneys. Their primary function is the synthesis and secretion of renin, an enzyme that plays a crucial role in regulating blood pressure and fluid balance. Renin is released in response to various stimuli, such as low blood pressure in the arterioles, decreased sodium chloride concentration detected by the macula densa cells (which are part of the nephron structure), and sympathetic nervous system stimulation. Once renin is secreted into the bloodstream, it acts on angiotensinogen, converting it into angiotensin I, which is subsequently converted to angiotensin II—an essential peptide that increases blood pressure through vasoconstriction and by stimulating aldosterone release from the adrenal glands. While podocytes, mesangial cells, and macula densa cells perform important functions in kidney physiology, they do not secrete renin. Podocytes are involved in the filtration barrier of the glomeruli, mesangial cells provide structural support and regulate blood flow within the glomerulus, and macula densa cells sense changes in sodium concentration but do not

8. Which of the following decreases stroke volume and contractility?

- A. Heart failure**
- B. Myocardial infarction**
- C. Acidosis**
- D. All of the above**

Decreasing stroke volume and contractility can occur due to several physiological conditions. In the context of this question, each scenario affects the heart's ability to pump effectively. Heart failure is a condition where the heart's ability to pump blood is impaired, leading to decreased stroke volume. It often results from chronic hypertension or previous myocardial injury, leading to alterations in cardiac structure and function. In heart failure, the weakened myocardium cannot contract as forcefully, thus reducing contractility and stroke volume. Myocardial infarction, commonly known as a heart attack, causes damage to the heart muscle due to a prolonged lack of blood supply. This damage can directly reduce the muscle's contractile strength, leading to decreased stroke volume. The area of the heart that is infarcted will not contribute effectively to the heart's pumping ability, thereby diminishing the overall contractility. Acidosis, characterized by an increase in hydrogen ion concentration in the blood, can negatively impact cardiac function. The acidic environment can interfere with myocardial metabolism and electrical activity, reducing contractility. It affects the heart's sensitivity to calcium, which is crucial for proper muscle contraction, leading to a decrease in both contractility and stroke volume. Since all three conditions—heart failure, myocardial infarction, and

9. What type of breathing is characterized by the contraction of the abdominal muscles?

- A. Normal breathing**
- B. Forced inspiration**
- C. Forced expiration**
- D. Sighing**

The type of breathing characterized by the contraction of the abdominal muscles is forced expiration. During forced expiration, the diaphragm and external intercostal muscles relax, and the abdominal muscles contract. This contraction increases intra-abdominal pressure and helps to push air out of the lungs more forcefully, typically during activities like heavy exercise, coughing, or yelling. This mechanism allows for a rapid and efficient expulsion of air from the lungs, clearing the airways or allowing for more vigorous ventilation. Understanding the mechanics of forced expiration is essential for recognizing how our bodies adapt to various physical demands and activities.

10. Which gas has a higher concentration in the bloodstream compared to its concentration in the lungs?

- A. Oxygen**
- B. Carbon Dioxide**
- C. Both gases are equal**
- D. Nitrogen**

Carbon dioxide has a higher concentration in the bloodstream compared to its concentration in the lungs due to the processes of cellular metabolism and gas exchange. Throughout the body, cells produce carbon dioxide as a byproduct during the metabolism of glucose and other substrates. This carbon dioxide is released into the bloodstream, where it is carried to the lungs. In the lungs, gas exchange occurs in the alveoli, where carbon dioxide diffuses from the blood (where its concentration is higher) into the alveolar air (where its concentration is lower) to be exhaled. As a result, the concentration of carbon dioxide is typically greater in the blood than in the lungs at any given moment, leading to its preferential movement out of the bloodstream and into the alveoli for elimination. Oxygen, on the other hand, is inhaled into the lungs and diffuses into the bloodstream, where its concentration generally increases relative to its lower concentration in the lungs. Nitrogen remains largely inert and does not significantly participate in gas exchange, as it has a very low solubility in blood and does not undergo significant changes in concentration in blood compared to the lungs during normal respiration. Therefore, the understanding of gas exchanges during respiration reveals that carbon dioxide is the gas that maintains a higher concentration

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://nbeogenphysiology.examzify.com>

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

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