

# IMAT BIOLOGY PRACTICE EXAM (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. If blood volume is low and osmolarity is high (dehydration), what happens to urine?**

- A. Urine becomes more dilute.
- B. Urine output increases.
- C. Urine becomes highly concentrated due to water conservation.
- D. Urine production stops.

**2. Aldosterone is described as what?**

- A. A hormone that reduces Na<sup>+</sup> retention and lowers blood volume.
- B. Salt-retaining hormone that promotes Na<sup>+</sup> retention by the kidneys; acts on the DCT; released by the adrenal cortex; responds to decreased blood pressure.
- C. A hormone produced by the kidneys to stimulate urine production.
- D. A molecule that inhibits aldose.

**3. Which statement correctly describes the peripheral nervous system?**

- A. It includes the brain and spinal cord.
- B. It includes the sensory and motor neurons that connect the CNS to the rest of the body.
- C. It controls all involuntary processes only.
- D. It resides entirely within the skull.

**4. Negative feedback is?**

- A. A mechanism that reduces a stimulus after a response
- B. A mechanism of response in which a stimulus initiates reactions that reduce the stimulus
- C. A process that initiates growth
- D. A system that maintains constant temperature without feedback

**5. Which mutation type changes a codon to a stop codon?**

- A. Missense mutation
- B. Nonsense mutation
- C. Frameshift mutation
- D. Silent mutation

**6. What is the function of helicase?**

- A. Joins Okazaki fragments
- B. Breaks hydrogen bonds to separate DNA strands
- C. Proofreads the new DNA
- D. Adds nucleotides to the growing strand

**7. Which band contains the thick filaments in their entirety?**

- A. A-band
- B. I-band
- C. H-zone
- D. Z-line

**8. Which statement about meiosis is true?**

- A. It increases the chromosome number.
- B. It produces genetically identical diploid gametes.
- C. It reduces chromosome number and increases genetic variation.
- D. It occurs only in prokaryotes.

**9. Progesterone has three main functions. Which statement best describes one of these functions?**

- A. Stimulates ovulation
- B. Maintains pregnancy and endometrium, and provides negative feedback on gonadotropins
- C. Breaks down fats
- D. Stimulates milk production

**10. Which part of the nephron concentrates urine during reabsorption?**

- A. Loop of Henle
- B. Bowman's capsule
- C. Collecting duct
- D. Glomerulus

## **Answers**

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

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## **Explanations**

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**1. If blood volume is low and osmolarity is high (dehydration), what happens to urine?**

- A. Urine becomes more dilute.
- B. Urine output increases.
- C. Urine becomes highly concentrated due to water conservation.**
- D. Urine production stops.

*In dehydration the body aims to conserve water, so the urine becomes highly concentrated because ADH increases water reabsorption in the kidneys. Osmoreceptors detect high plasma osmolality and signal the posterior pituitary to release antidiuretic hormone. ADH makes the collecting ducts more permeable to water, pulling more water back into the bloodstream. The result is a small volume of urine with a high concentration of solutes (urine osmolality rises), reflecting the emphasis on water conservation. If dehydration is severe, urine output can drop substantially, but it typically does not stop entirely.*

**2. Aldosterone is described as what?**

- A. A hormone that reduces Na<sup>+</sup> retention and lowers blood volume.
- B. Salt-retaining hormone that promotes Na<sup>+</sup> retention by the kidneys; acts on the DCT; released by the adrenal cortex; responds to decreased blood pressure.**
- C. A hormone produced by the kidneys to stimulate urine production.
- D. A molecule that inhibits aldose.

*Aldosterone is a salt-retaining hormone produced by the adrenal cortex. It increases sodium reabsorption in the kidney, particularly in the distal convoluted tubule, and promotes water retention to raise blood volume and pressure. It is released in response to signals of low blood pressure or low sodium via the renin-angiotensin-aldosterone system. This description fits because it specifies its role in retaining Na<sup>+</sup>, its site of action in the kidney, its adrenal origin, and its response to decreased blood pressure. The other options misstate its function or origin: one suggests it reduces Na<sup>+</sup> retention and lowers blood volume; another says it's produced by the kidneys to stimulate urine production; and another mentions inhibiting aldose, which is unrelated.*

**3. Which statement correctly describes the peripheral nervous system?**

- A. It includes the brain and spinal cord.
- B. It includes the sensory and motor neurons that connect the CNS to the rest of the body.**
- C. It controls all involuntary processes only.
- D. It resides entirely within the skull.

*The peripheral nervous system consists of all nerves outside the brain and spinal cord that connect the central nervous system to the rest of the body. This means it contains sensory neurons that carry information from receptors to the CNS and motor neurons that carry commands from the CNS to muscles and glands. That description aligns with the statement that the peripheral nervous system includes the sensory and motor neurons that connect the CNS to the rest of the body. The brain and spinal cord themselves are part of the central nervous system, not the peripheral. The PNS also includes both somatic pathways (voluntary movement) and autonomic pathways (involuntary functions), and it extends beyond the skull to reach limbs and organs, not remaining entirely within the head.*

#### 4. Negative feedback is?

- A. A mechanism that reduces a stimulus after a response
- B. A mechanism of response in which a stimulus initiates reactions that reduce the stimulus**
- C. A process that initiates growth
- D. A system that maintains constant temperature without feedback

*Negative feedback is a control process that keeps conditions stable by opposing a deviation from a set point. When a variable changes, sensors detect it and trigger effects that reverse that change, bringing the variable back toward the normal range. This creates a loop where the initial stimulus is opposed by the response, reducing the stimulus as the response happens. For example, when body temperature rises, sweating and increased blood flow to the skin help cool the body; when blood glucose rises after a meal, insulin is released to lower glucose levels. The mechanism described in the option that states a stimulus initiates reactions that reduce the stimulus best fits this idea. The other ideas either describe growth rather than regulation, or claim there is no feedback while maintaining a constant temperature.*

#### 5. Which mutation type changes a codon to a stop codon?

- A. Missense mutation
- B. Nonsense mutation**
- C. Frameshift mutation
- D. Silent mutation

*A codon-to-stop codon change is a nonsense mutation. This happens when a single nucleotide substitution alters a codon so that it becomes one of the three stop codons (UAA, UAG, or UGA in mRNA; TAA, TAG, or TGA in DNA). The result is premature termination of translation, producing a truncated polypeptide that is usually nonfunctional. This differs from a missense mutation, which changes the codon to encode a different amino acid; a silent mutation, which changes the codon to another that still encodes the same amino acid and doesn't alter the protein sequence; and a frameshift mutation, which arises from insertions or deletions that shift the whole reading frame and typically disrupt the entire downstream amino acid sequence, potentially creating a premature stop as a secondary effect but not by directly changing a codon to a stop codon.*

#### 6. What is the function of helicase?

- A. Joins Okazaki fragments
- B. Breaks hydrogen bonds to separate DNA strands**
- C. Proofreads the new DNA
- D. Adds nucleotides to the growing strand

*Unwinding the DNA double helix to create single-stranded templates is the essential step in replication, and helicase does this by breaking the hydrogen bonds between base pairs using energy from ATP. This separation opens up the replication fork so that DNA polymerases can access each strand and synthesize new complementary strands. Other enzymes have different roles: ligase joins Okazaki fragments on the lagging strand; proofreading is done by the polymerase's exonuclease activity to correct mistakes; and DNA polymerase adds nucleotides to the growing strand.*

## 7. Which band contains the thick filaments in their entirety?

**A. A-band**

B. I-band

C. H-zone

D. Z-line

*This question tests how thick and thin filaments are arranged along a muscle's sarcomere. The thick filaments, made of myosin, run the full length of the A-band, so that band contains the entire length of the thick filaments. The I-band has only thin filaments, and the Z-line marks the sarcomere boundary where actin attaches. The central H-zone falls within the A-band and contains only thick filaments, but it does not span the whole length of the thick filaments. Therefore, the band that contains the thick filaments in their entirety is the A-band.*

## 8. Which statement about meiosis is true?

A. It increases the chromosome number.

B. It produces genetically identical diploid gametes.

**C. It reduces chromosome number and increases genetic variation.**

D. It occurs only in prokaryotes.

*Meiosis halves the chromosome number to form haploid gametes and also creates genetic variation. As homologous chromosomes pair and exchange genetic material during prophase I, crossing over mixes alleles. Then the random orientation of these pairs during metaphase I and their separation in anaphase I further shuffles genetic material. The result is four genetically unique haploid cells, not identical copies. This contrasts with the idea of increasing chromosome number or producing diploid, identical gametes, and it also isn't something that happens in prokaryotes.*

## 9. Progesterone has three main functions. Which statement best describes one of these functions?

A. Stimulates ovulation

**B. Maintains pregnancy and endometrium, and provides negative feedback on gonadotropins**

C. Breaks down fats

D. Stimulates milk production

*Progesterone's key role is to prepare and maintain the uterine lining for pregnancy and to support pregnancy itself. After ovulation, progesterone from the corpus luteum thickens and stabilizes the endometrium, enabling implantation and supporting decidualization. It also helps keep the uterus relaxed to prevent contractions during pregnancy. In addition, progesterone provides negative feedback to the hypothalamus and pituitary, lowering GnRH, FSH, and LH release, which helps prevent another ovulation while pregnancy is ongoing. This combination of maintaining the endometrium, supporting pregnancy, and regulating hormone release explains why this statement is the best description of progesterone's functions. Other options don't fit: ovulation is driven by estrogen and LH surge, not progesterone; fat breakdown isn't a primary role of progesterone; and milk production is controlled by prolactin, with progesterone actually inhibiting lactation during pregnancy.*

## 10. Which part of the nephron concentrates urine during reabsorption?

A. Loop of Henle

B. Bowman's capsule

C. Collecting duct

D. Glomerulus

*Concentration of urine relies on the kidney's ability to create a medullary osmotic gradient through the loop of Henle, a setup that uses a countercurrent flow to drive water reabsorption. As filtrate moves down the descending limb, it encounters an increasingly hyperosmotic interstitium, so water leaves by osmosis and the filtrate becomes more concentrated. The ascending limb, in contrast, actively pumps out salts but is impermeable to water, which dilutes the filtrate and helps build the gradient in the surrounding tissue. This established gradient is what allows water reabsorption from the collecting duct later on, producing concentrated urine when antidiuretic hormone is present. The loop of Henle is the site where significant water reabsorption occurs to concentrate the filtrate, setting up the conditions for final urine concentration. Bowman's capsule and the glomerulus are primarily filtration structures, not sites of concentrating reabsorption, and the collecting duct carries out the final step of water reabsorption under hormonal control.*

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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](mailto:hello@examzify.com).

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

<https://imatbiology.examzify.com>

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

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