

PLTW BIOMEDICAL SCIENCE END OF COURSE (EOC) PRACTICE TEST (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 treatment is essential for managing Type 1 diabetes?**
 - A. Carb counting
 - B. Take insulin
 - C. Healthy eating and exercise
 - D. Frequent blood sugar monitoring
- 2. Which blood component is primarily responsible for clotting?**
 - A. white blood cells
 - B. red blood cells
 - C. platelets
 - D. plasma
- 3. Sickle cell disease is caused by what type of genetic change?**
 - A. A point mutation on chromosome 11
 - B. A chromosomal deletion on chromosome 11
 - C. A frameshift mutation on chromosome 1
 - D. A duplication on chromosome 20
- 4. Which component of blood carries oxygen to the tissues?**
 - A. White blood cells
 - B. Plasma
 - C. Platelets
 - D. Red blood cells
- 5. Which term describes a solution with the same solute concentration as inside the cell?**
 - A. Hypertonic solution
 - B. Isotonic solution
 - C. Hypotonic solution
 - D. Osmotic solution
- 6. What do beta cells do?**
 - A. Produce glucagon
 - B. Produce insulin
 - C. Decrease glucose
 - D. Increase glycogen

7. Which chromosome is the shortest in humans?

- A. Chromosome 22
- B. Chromosome 1
- C. Chromosome 18
- D. Chromosome 11

8. Which statement about HIPAA is true?

- A. HIPAA primarily protects the privacy of medical information
- B. HIPAA regulates hospital staffing levels
- C. HIPAA sets vacation policies for staff
- D. HIPAA governs what foods are served in cafeterias

9. What is the function of an ACE inhibitor?

- A. A medication that increases enzyme activity
- B. A medication that lowers heart rate by increasing activity
- C. A medication that blocks LDL receptors
- D. A medication that slows enzyme activity

10. What is the function of insulin?

- A. It controls glucose levels in the plasma by enabling glucose uptake into cells.
- B. It stimulates glucose production in the liver.
- C. It increases glucose in blood.
- D. It blocks glucose from entering cells.

Answers

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

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Explanations

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1. Which treatment is essential for managing Type 1 diabetes?

- A. Carb counting
- B. Take insulin**
- C. Healthy eating and exercise
- D. Frequent blood sugar monitoring

In Type 1 diabetes the body stops producing insulin, the hormone that allows glucose to enter cells to be used for energy. Without insulin, blood glucose rises and the body can't regulate energy or prevent dangerous change in blood chemistry. Replacing that missing hormone with insulin therapy is essential for survival and for keeping blood sugar within a safe range. Insulin can be given through injections or an insulin pump and is carefully adjusted based on meals, activity, and glucose readings. Other practices like counting carbohydrates, eating healthfully and staying active, and regularly monitoring blood sugar are important for managing daily control, but they do not replace the need for insulin in Type 1.

2. Which blood component is primarily responsible for clotting?

- A. white blood cells
- B. red blood cells
- C. platelets**
- D. plasma

Clotting starts with platelets, the small cell fragments that rush to a damaged vessel and stick to the exposed site. They adhere, become activated, and release signals that recruit more platelets to form a quick platelet plug, which is the first fast seal of a break in the vessel. Plasma then provides the clotting factors that lay down a fibrin mesh to strengthen and stabilize that plug, but the initial and primary action in forming the clot comes from platelets. Red blood cells and white blood cells aren't responsible for forming clots, while plasma supplies the chemicals needed for the full coagulation cascade.

3. Sickle cell disease is caused by what type of genetic change?

- A. A point mutation on chromosome 11**
- B. A chromosomal deletion on chromosome 11
- C. A frameshift mutation on chromosome 1
- D. A duplication on chromosome 20

A single-nucleotide substitution in the beta-globin gene (HBB) on chromosome 11 causes sickle cell disease. This is a missense point mutation, where one base change alters a codon so that the sixth amino acid of the beta-globin chain changes from glutamic acid to valine. That small change produces hemoglobin S, which tends to polymerize under low oxygen and makes red blood cells become stiff and sickle-shaped. This differs from a chromosomal deletion (removing genetic material), a frameshift mutation (insertions or deletions that shift the reading frame and alter many downstream amino acids), or a duplication (adding extra copies of genetic material). So the described genetic change is a point mutation on chromosome 11.

4. Which component of blood carries oxygen to the tissues?

- A. White blood cells
- B. Plasma
- C. Platelets
- D. Red blood cells**

Oxygen is carried to tissues primarily by red blood cells because they contain hemoglobin, the iron-containing protein that binds to oxygen in the lungs and releases it where tissues need it. Hemoglobin picks up oxygen in the lungs (where oxygen pressure is high) and releases it as blood flows to tissues (where oxygen pressure is low), while also helping carry carbon dioxide back to the lungs to be exhaled. The liquid part of blood, plasma, serves as a transport medium for nutrients, hormones, and wastes; white blood cells are involved in immune defense; platelets help with blood clotting. So the component that delivers oxygen to tissues is red blood cells.

5. Which term describes a solution with the same solute concentration as inside the cell?

- A. Hypertonic solution
- B. Isotonic solution**
- C. Hypotonic solution
- D. Osmotic solution

Tonicity describes how the solute concentration outside a cell compares to the inside and how water moves by osmosis. When the outside solution has the same solute concentration as the inside of the cell, the situation is isotonic. In this case, water moves in and out at equal rates, so there is no net water flow and the cell maintains its normal size and function. For example, physiological saline around 0.9% NaCl is isotonic to many human cells, keeping them stable. If the outside solution has more solute (hypertonic), water leaves the cell and it shrinks. If the outside has less solute (hypotonic), water enters the cell and it may swell or burst. The term "osmotic solution" isn't a standard way to describe this balance, since it refers to osmosis in general rather than a specific condition of equal concentration.

6. What do beta cells do?

- A. Produce glucagon
- B. Produce insulin**
- C. Decrease glucose
- D. Increase glycogen

Beta cells regulate blood sugar by releasing insulin in response to high glucose levels. Insulin helps cells, especially in muscle and fat tissue, take up glucose from the bloodstream, lowering blood glucose. It also signals the liver to store excess glucose as glycogen, contributing to the overall decrease in blood sugar after a meal. The other options refer to different cells or to effects, not the direct action of beta cells: glucagon is produced by alpha cells, and while insulin can lead to glycogen storage, the key action of beta cells is producing insulin.

7. Which chromosome is the shortest in humans?

- A. Chromosome 22**
- B. Chromosome 1
- C. Chromosome 18
- D. Chromosome 11

Chromosome length varies across the human genome, with some chromosomes containing more DNA than others. The shortest chromosome by base-pair length is chromosome 21, which is why it's frequently linked to Down syndrome—the condition arises when an individual has an extra copy of this comparatively small chromosome. The other options are longer in DNA content, so they are not the shortest. In short, chromosome 21 is the shortest in humans by DNA length.

8. Which statement about HIPAA is true?

- A. HIPAA primarily protects the privacy of medical information**
- B. HIPAA regulates hospital staffing levels
- C. HIPAA sets vacation policies for staff
- D. HIPAA governs what foods are served in cafeterias

HIPAA protects the privacy and security of patient health information. The Privacy Rule sets limits on how health information can be used or shared by providers, health plans, and others who handle PHI, and it gives patients rights to access and control their records. It also requires safeguards for electronic PHI under the Security Rule. This focus on confidentiality and proper disclosure is what HIPAA is all about in real-world practice—like avoiding discussing a patient's details in public or with people who aren't involved in their care. The other statements don't fit because HIPAA doesn't regulate staffing levels, vacation policies, or cafeteria menus; those are handled by internal policies or other regulations, not HIPAA.

9. What is the function of an ACE inhibitor?

- A. A medication that increases enzyme activity
- B. A medication that lowers heart rate by increasing activity
- C. A medication that blocks LDL receptors
- D. A medication that slows enzyme activity**

ACE inhibitors block the action of angiotensin-converting enzyme (ACE). This enzyme normally converts angiotensin I to angiotensin II, a strong vasoconstrictor. By inhibiting ACE, less angiotensin II is produced, so blood vessels relax and blood pressure falls. They also reduce aldosterone release, which lowers blood volume. In short, these drugs slow the enzyme's activity by preventing it from doing its job, rather than increasing activity or affecting LDL receptors or heart rate directly.

10. What is the function of insulin?

- A. It controls glucose levels in the plasma by enabling glucose uptake into cells.
- B. It stimulates glucose production in the liver.
- C. It increases glucose in blood.
- D. It blocks glucose from entering cells.

Insulin's job is to lower blood sugar by helping glucose move from the bloodstream into cells. After eating, the pancreas releases insulin, which binds to receptors on muscle and fat cells and triggers a signal that brings GLUT4 transporters to the cell surface. This lets glucose enter the cells to be used for energy or stored as glycogen, and it also signals the liver to store excess glucose. Because of this, insulin reduces the amount of glucose circulating in the plasma rather than increasing it. The other options describe effects insulin does not have: it doesn't stimulate hepatic glucose production, it doesn't raise blood glucose, and it doesn't block glucose from entering cells.

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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://pltwbiomedscienceeoc.examzify.com>

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

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