

PMLS HISTORY OF MEDICAL TECHNOLOGY IN GLOBAL CONTEXT 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. Who discovered serum antitoxins and used them to develop tetanus and diphtheria vaccines in 1890?**
 - A. Louis Pasteur
 - B. Karl Landsteiner
 - C. Wilhelm Roentgen
 - D. Emil von Behring

- 2. Which organization publishes widely used laboratory testing guidelines and was formerly NCCLS?**
 - A. NCCLS
 - B. CLSI (Clinical and Laboratory Standards Institute)
 - C. CAP (College of American Pathologists)
 - D. ISO

- 3. Which act is officially titled The Medical Technology Act, governing the regulation of medical laboratory practice?**
 - A. The Medical Technology Act
 - B. The Hospital Establishment Act
 - C. The Biomedical Devices Act
 - D. The Clinical Laboratory Act

- 4. The fluorescent antibody technique enabling specific antigen detection was developed by which scientist?**
 - A. Karl Landsteiner
 - B. Albert Coons
 - C. Louis Pasteur
 - D. Robert Koch

- 5. The ABO blood group system was discovered by which physician?**
 - A. Edward Jenner
 - B. Alexander Fleming
 - C. Karl Landsteiner
 - D. Louis Pasteur

- 6. Mass spectrometry in clinical analysis is primarily used to identify and quantify what by measuring a key property?**
- A. Mass-to-charge ratio of ions
 - B. Absorbance at 450 nm
 - C. Fluorescence intensity
 - D. Elemental composition alone without fragmentation
- 7. The confirmatory test commonly used after an initial HIV screen is what?**
- A. ELISA
 - B. PCR
 - C. RT-PCR
 - D. HIV Western blot (immunoblot)
- 8. Which statement about the 19th Century is true?**
- A. Era of Rapid Discoveries
 - B. Era of Antibiotics
 - C. Era of Enlightenment
 - D. Era of Stagnation
- 9. The Rh blood group system (D antigen) was characterized by which researchers?**
- A. Karl Landsteiner
 - B. Alexander S. Wiener
 - C. Karl Landsteiner and Alexander S. Wiener
 - D. Edward Jenner
- 10. The Coulter counter relies on which physical principle to count cells?**
- A. Ultracentrifugation
 - B. Electrical impedance
 - C. Optical diffraction
 - D. Magnetic resonance

Answers

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

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Explanations

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1. Who discovered serum antitoxins and used them to develop tetanus and diphtheria vaccines in 1890?

- A. Louis Pasteur
- B. Karl Landsteiner
- C. Wilhelm Roentgen
- D. Emil von Behring**

Antitoxins in serum neutralize specific bacterial toxins, giving passive immunity by supplying ready-made antibodies. Emil von Behring showed that serum from animals immunized against diphtheria and tetanus contained these protective antibodies. When that serum was transferred to other animals—or to humans in severe cases—it neutralized the toxins and prevented disease. This demonstrated a practical way to treat toxin-mediated infections and laid the groundwork for serum therapy and the broader concept behind vaccines. Behring's work in 1890 marked a turning point in immunology, illustrating how antibody-containing serum could confer protection against disease. (Pasteur advanced vaccines for other diseases, Landsteiner is known for blood groups, and Roentgen for X-rays, but the serum antitoxin breakthrough specifically belongs to Behring.)

2. Which organization publishes widely used laboratory testing guidelines and was formerly NCCLS?

- A. NCCLS
- B. CLSI (Clinical and Laboratory Standards Institute)**
- C. CAP (College of American Pathologists)
- D. ISO

CLSI, the Clinical and Laboratory Standards Institute, is the organization that publishes the widely used laboratory testing guidelines and was formerly known as NCCLS. The name change reflects the same entity expanding its scope to cover both clinical and laboratory standards. Labs around the world reference CLSI guidelines for method validation, quality control, and antimicrobial susceptibility testing, making it the go-to source for standard practices. CAP focuses on accreditation and proficiency testing, ISO provides broader international standards (not specific to clinical lab testing guidelines), and NCCLS is the former name of CLSI, not the current publisher.

3. Which act is officially titled The Medical Technology Act, governing the regulation of medical laboratory practice?

- A. The Medical Technology Act**
- B. The Hospital Establishment Act
- C. The Biomedical Devices Act
- D. The Clinical Laboratory Act

Understanding regulatory acts that govern medical laboratory practice helps you see how professional standards, licensing, and quality control are enforced. The official title The Medical Technology Act directly names the field it regulates—medical technology and laboratory work—so it is the statute designed to oversee licensing of medical technologists, requirements for lab facilities, and quality assurance programs that ensure accurate and safe testing. The other acts cover related areas but not the specific regulation of medical laboratory practice under that exact title. The Hospital Establishment Act focuses on creating and governing hospitals, not on regulating lab work itself. The Biomedical Devices Act centers on the safety and approval of medical devices, not the practice of laboratory testing. A Clinical Laboratory Act would regulate clinical laboratories in some contexts, but the question specifies the act by its official title, which is The Medical Technology Act.

4. The fluorescent antibody technique enabling specific antigen detection was developed by which scientist?

- A. Karl Landsteiner
- B. Albert Coons**
- C. Louis Pasteur
- D. Robert Koch

The key idea here is how scientists first enabled specific detection of antigens using antibodies labeled with fluorescent dyes. Albert Coons showed that you could tag antibodies with a fluorescent marker, bind them to their target antigen in a tissue or sample, and then visualize the precise location of that antigen under a fluorescence microscope. This approach, developed in the early 1940s, opened up a powerful way to see exactly where specific antigens are present, making it possible to identify pathogens, immune components, and cellular markers with great specificity. The other scientists mentioned made foundational contributions to immunology and microbiology—such as blood group serology, germ theory and vaccines, and identifying disease-causing organisms—but they did not develop this fluorescent antibody technique.

5. The ABO blood group system was discovered by which physician?

- A. Edward Jenner
- B. Alexander Fleming
- C. Karl Landsteiner**
- D. Louis Pasteur

The main idea here is understanding how blood compatibility works. Karl Landsteiner showed that red blood cells carry different surface antigens, specifically A and B, and that people have antibodies in their plasma against the antigens they don't possess. By discovering the ABO blood group system in 1901, he explained why some transfusions caused agglutination and others didn't, leading to a safe way to match donors and recipients. This classification into A, B, AB, and O types made transfusion medicine possible and dramatically reduced lethal reactions. Landsteiner's work is foundational to modern immunohematology and earned him the Nobel Prize in 1930. Other famous physicians like Jenner, Fleming, and Pasteur made breakthroughs in vaccination, antibiotics, and germ theory, but not in blood typing.

6. Mass spectrometry in clinical analysis is primarily used to identify and quantify what by measuring a key property?

- A. Mass-to-charge ratio of ions**
- B. Absorbance at 450 nm
- C. Fluorescence intensity
- D. Elemental composition alone without fragmentation

Mass spectrometry identifies and quantifies substances by measuring the mass-to-charge ratio of ionized molecules. When a sample is ionized, the resulting ions have specific m/z values that act like fingerprints for different compounds. Detecting these ions and how strong their signals are lets you both confirm what is present (through characteristic m/z and fragmentation patterns) and determine how much is there (based on signal intensity relative to a calibration). The other options touch on different detection principles—colorimetric absorbance, fluorescence, or simply elemental composition without using the instrumental fragmentation and separation that mass spectrometry relies on—so they don't describe the fundamental measurement that defines MS in clinical analysis.

7. The confirmatory test commonly used after an initial HIV screen is what?

- A. ELISA
- B. PCR
- C. RT-PCR
- D. HIV Western blot (immunoblot)**

After an initial HIV screen, you want a test with high specificity to confirm true infection. HIV Western blot (immunoblot) does this by detecting antibodies to several specific HIV proteins (such as p24, gp41, and gp120/160). Because it requires antibodies to multiple viral components, it reduces the chance of a false positive that might occur with the screening test, giving a more definitive result. Historically, a positive pattern of these bands indicates infection, while incomplete or unclear patterns are considered indeterminate and require further testing. In contrast, tests that look for the virus's genetic material (PCR or RT-PCR) or the screening test itself are not used as the standard confirmatory antibody test after the initial screen.

8. Which statement about the 19th Century is true?

- A. Era of Rapid Discoveries**
- B. Era of Antibiotics
- C. Era of Enlightenment
- D. Era of Stagnation

The main idea is that the 19th century was a time of rapid, transformative discoveries in science and medicine that reshaped how medicine is practiced. This period saw germ theory shift the understanding of disease from older ideas like miasma to microscopic causation, with Pasteur and Koch demonstrating that microorganisms cause illness. That realization paved the way for antiseptic methods and sterile surgery under Lister, dramatically reducing infections. Anesthesia also emerged, enabling safer, more complex surgical procedures and fueling further medical progress. Advances in diagnostic tools and lab techniques—such as X-rays and improved staining and culture methods—began turning medicine into a more evidence-based, laboratory-driven field. All of this points to a surge of discoveries across multiple domains, characteristic of an era defined by rapid progress rather than stagnation or idle periods. The antibiotic era comes later in the 20th century, the Enlightenment is a much earlier period focused on philosophy and reform, and stagnation would contradict the visible, ongoing breakthroughs of the time.

9. The Rh blood group system (D antigen) was characterized by which researchers?

- A. Karl Landsteiner
- B. Alexander S. Wiener
- C. Karl Landsteiner and Alexander S. Wiener**
- D. Edward Jenner

The D antigen of the Rh blood group system was identified by Karl Landsteiner and Alexander S. Wiener. Their landmark work in 1940 showed there is a separate red cell antigen system beyond ABO, explaining why some people are Rh-positive and others Rh-negative. The name Rh comes from early experiments with blood from Rhesus monkeys, but the important point is that this discovery established a distinct, highly immunogenic antigen system used to assess transfusion compatibility and to understand hemolytic disease of the newborn. Edward Jenner is known for the smallpox vaccine, and while Landsteiner's earlier work defined the ABO system, the Rh system required Wiener's collaboration.

10. The Coulter counter relies on which physical principle to count cells?

- A. Ultracentrifugation
- B. Electrical impedance**
- C. Optical diffraction
- D. Magnetic resonance

The principle being tested is electrical impedance counting. In a Coulter counter, cells suspended in conductive fluid pass through a very small aperture with a constant electrical current flowing. When a cell traverses the aperture, it displaces electrolyte and briefly changes the impedance of the circuit, producing a pulse. The height of each pulse is proportional to the cell's volume, and the number of pulses corresponds to the cell count in the sample. This electrical impedance method specifically distinguishes the Coulter counter from methods based on ultracentrifugation, optical diffraction, or magnetic resonance, which rely on density separation, light-based detection, or magnetic properties, respectively.

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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://pmlshistmedtechinglobal.examzify.com>

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

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