

UAMS MEDICAL LABORATORY TECHNICIAN—MEDICAL LABORATORY SCIENTIST (MLT-MLS) PRACTICE EXAM (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 test differentiates Staphylococcus from Streptococcus in routine identification?**
 - A. Gram stain
 - B. Oxidase test
 - C. Catalase test
 - D. Coagulase test
- 2. Which medium is NOT used for Bordetella pertussis culture?**
 - A. Bordet-Gengou
 - B. Regan-Lowe
 - C. Loeffler's serum medium
 - D. Blood agar
- 3. Coagulase-negative Staphylococcus species is most commonly associated with indwelling medical devices?**
 - A. Staphylococcus aureus
 - B. Staphylococcus epidermidis
 - C. Streptococcus pyogenes
 - D. Streptococcus agalactiae
- 4. Which Mycobacterium requires X factor for growth and is associated with rare disease in immunocompromised hosts?**
 - A. Mycobacteria leprae
 - B. Mycobacteria avium complex
 - C. Mycobacteria kansasii
 - D. Mycobacteria haemophilum
- 5. Which hazard category is indicated by the Red Diamond in NFPA labeling?**
 - A. Health Hazard (0- Normal; 1- Slightly Hazardous; 2- Hazardous; 3- Extreme Danger; 4- Deadly)
 - B. Instability Hazard (0- Stable; 1- unstable if heated; 2- violent chemical change; 3- shock and heat may detonate; 4- may detonate)
 - C. Fire Hazard (0- Will not burn; 1- Above 200 F; 2- Below 200 F; 3- Below 100 F; 4- Below 73 F)
 - D. Specific Hazard (Use no water, Radiation, oxidizer, corrosive, alkali, acid)

6. Which organism is beta-hemolytic group A streptococcus and typically susceptible to the bacitracin disk and PYR positive?
- A. Streptococcus agalactiae
 - B. Streptococcus pneumoniae
 - C. Streptococcus pyogenes
 - D. Enterococcus faecalis
7. Which organism is beta-hemolytic and catalase negative?
- A. Corynebacterium species
 - B. Erysipelothrix rhusiopathiae
 - C. Arcanobacterium haemolyticus
 - D. Lactobacillus species
8. RBC casts in urine are most characteristic of which condition?
- A. Acute Glomerulonephritis
 - B. Acute Pyelonephritis
 - C. Nephrotic Syndrome
 - D. Urinary Tract Infection
9. Which RBC product specifically uses ADSOL with a 42-day shelf-life?
- A. Leukocyte- Reduced RBCs (CPDA- 35 days; ADSOL- 42 days)
 - B. Washed Red Cells (CPDA- 35 days)
 - C. Packed RBCs (CPDA- 35 days; ADSOL- 42 days)
 - D. Platelets (20-24 C; 5 days)
10. Which statement about Enterococcus resistance is true?
- A. Enterococci are intrinsically resistant to many antibiotics, and some strains (E. faecalis and E. faecium) can acquire resistance.
 - B. Enterococci are susceptible to all antibiotics
 - C. Enterococcus faecalis and faecium have no resistance
 - D. Enterococcus is always vancomycin susceptible

Answers

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

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Explanations

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1. Which test differentiates Staphylococcus from Streptococcus in routine identification?

- A. Gram stain
- B. Oxidase test
- C. Catalase test**
- D. Coagulase test

Catalase activity is what separates Staphylococcus from Streptococcus in routine workups. When you contaminate a slide with a colony and add hydrogen peroxide, catalase-positive organisms rapidly produce bubbles as oxygen gas is released. Staphylococcus species are catalase-positive, so you'll see fizzing. Streptococcus species are catalase-negative, so there's little to no bubbling. This quick result is a practical first step after observing Gram-positive cocci, guiding you toward Staphylococcus if positive and toward Streptococcus (or Enterococcus) if negative, with further tests required to pinpoint the exact species. The other tests aren't as useful for this cross-genus distinction: Gram stain can suggest cocci in clusters versus chains but doesn't reliably separate the two genera; the oxidase test isn't informative for these Gram-positive cocci; and the coagulase test helps differentiate Staphylococcus species within the genus (not between Staphylococcus and Streptococcus).

2. Which medium is NOT used for Bordetella pertussis culture?

- A. Bordet-Gengou
- B. Regan-Lowe
- C. Loeffler's serum medium**
- D. Blood agar

Growth of Bordetella pertussis relies on enriched, selective media because this organism is fastidious and grows slowly. Bordet-Gengou agar and Regan-Lowe medium are specifically designed to promote pertussis isolation and support its recovery from respiratory specimens. Loeffler's serum medium is formulated for Corynebacterium diphtheriae and does not provide the selective enrichment pertussis needs. Blood agar is non-selective and generally not reliable for pertussis isolation, so it isn't used for routine culture of this organism. Therefore, Loeffler's serum medium is the one not used for Bordetella pertussis culture.

3. Coagulase-negative Staphylococcus species is most commonly associated with indwelling medical devices?

- A. Staphylococcus aureus
- B. Staphylococcus epidermidis**
- C. Streptococcus pyogenes
- D. Streptococcus agalactiae

Staphylococcus epidermidis is the classic coagulase-negative Staphylococcus linked to infections of indwelling medical devices because it readily adheres to plastic surfaces and forms robust biofilms. These biofilms create a protective matrix that helps the bacteria stick to catheters, prosthetic joints, and other implants and also shields them from antibiotics and immune clearance, leading to persistent, device-associated infections. Staphylococcus aureus, while a common cause of many infections, is coagulase-positive and more often associated with acute infections rather than device-related biofilm infections. The streptococcal species listed are not coagulase-negative staphylococci and are typically linked to other clinical scenarios, such as pharyngitis, skin infections, or neonatal sepsis, rather than device colonization.

4. Which Mycobacterium requires X factor for growth and is associated with rare disease in immunocompromised hosts?

- A. Mycobacteria leprae
- B. Mycobacteria avium complex
- C. Mycobacteria kansasii
- D. Mycobacteria haemophilum**

Some mycobacteria are fastidious and require an extra nutrient, X factor, to grow. X factor is hemin (a heme source). Among the organisms listed, only Mycobacterium haemophilum requires X factor for growth, typically needing media supplemented with hemin and often preferring cooler incubation temperatures. This organism is also known for causing rare infections in immunocompromised hosts, such as disseminated disease or cutaneous lesions. The other mycobacteria listed do not rely on X factor for growth and have different clinical and culture characteristics: one is notoriously unculturable in standard media and causes leprosy, while the others are capable of growing on routine mycobacterial media.

5. Which hazard category is indicated by the Red Diamond in NFPA labeling?

- A. Health Hazard (0- Normal; 1- Slightly Hazardous; 2- Hazardous; 3- Extreme Danger; 4- Deadly)
- B. Instability Hazard (0- Stable; 1- unstable if heated; 2- violent chemical change; 3- shock and heat may detonate; 4- may detonate)
- C. Fire Hazard (0- Will not burn; 1- Above 200 F; 2- Below 200 F; 3- Below 100 F; 4- Below 73 F)**
- D. Specific Hazard (Use no water, Radiation, oxidizer, corrosive, alkali, acid)

The Red Diamond signals the fire hazard. In the NFPA 704 labeling system, each diamond covers a different hazard: blue for health, red for flammability (fire risk), yellow for instability/reactivity, and white for special hazards. The numbers on the red section show how easily a substance can ignite, with higher numbers meaning greater flammability. So, when you see the Red Diamond, you're being warned about how readily the material will burn, not about health effects or chemical reactivity.

6. Which organism is beta-hemolytic group A streptococcus and typically susceptible to the bacitracin disk and PYR positive?

- A. Streptococcus agalactiae
- B. Streptococcus pneumoniae
- C. Streptococcus pyogenes**
- D. Enterococcus faecalis

Identifying *Streptococcus pyogenes* relies on recognizing a beta-hemolytic, Lancefield group A organism that is susceptible to the bacitracin disk and positive for the PYR test. On blood agar, beta-hemolysis shows complete clearing around colonies, and group A strep characteristically falls into this pattern. The bacitracin disk test helps distinguish it from other beta-hemolytic streptococci because group A strains are typically inhibited by bacitracin, producing a clear zone of inhibition. The PYR test is positive for *Streptococcus pyogenes*, which further supports its identity when combined with the bacitracin susceptibility. To place it in context, group B strep (*Streptococcus agalactiae*) is beta-hemolytic but usually resistant to bacitracin and negative for PYR. *Streptococcus pneumoniae* is alpha-hemolytic (not beta) and is optochin sensitive, not bacitracin-based identification. *Enterococcus faecalis* is often PYR positive but not bacitracin susceptible and is typically gamma or sometimes alpha-hemolytic, not the same profile as group A beta-hemolytic strep. So the combination of beta-hemolysis, Lancefield group A, bacitracin susceptibility, and PYR positivity points to *Streptococcus pyogenes*.

7. Which organism is beta-hemolytic and catalase negative?

- A. *Corynebacterium* species
- B. *Erysipelothrix rhusiopathiae*
- C. *Arcanobacterium haemolyticus***
- D. *Lactobacillus* species

Understanding the result pattern helps identify the organism: beta-hemolysis means clear zones around colonies on blood agar from complete lysis of red cells, and a negative catalase test means no bubbling when hydrogen peroxide is added. The combination of beta-hemolysis with catalase negativity is characteristic of *Arcanobacterium haemolyticus*, a gram-positive rod that lacks catalase activity and produces a clear beta-hemolytic zone. Other organisms on the list either produce catalase (like *Corynebacterium* species) or are not typically beta-hemolytic (such as *Erysipelothrix rhusiopathiae* and *Lactobacillus* species). Thus, *Arcanobacterium haemolyticus* best fits the described results.

8. RBC casts in urine are most characteristic of which condition?

- A. Acute Glomerulonephritis**
- B. Acute Pyelonephritis
- C. Nephrotic Syndrome
- D. Urinary Tract Infection

RBC casts indicate bleeding from the glomerulus. They form when red blood cells escape from damaged glomerular capillaries into the filtrate and are trapped within a proteinaceous matrix in the distal tubules, producing casts that are excreted in urine. This pattern is most characteristic of glomerular inflammation, such as acute glomerulonephritis, where the glomeruli are damaged and bleed, leading to hematuria and RBC-containing casts. In acute pyelonephritis, the infection of the kidney tubular-collecting system typically yields white blood cell casts from tubular inflammation, and fever, flank pain, and pyuria are common—not the classic RBC casts. Nephrotic syndrome centers on massive protein loss with edema and lipiduria; RBC casts are not a defining feature there. Urinary tract infections can cause bacteriuria and sometimes white blood cell casts, but red cell-containing casts are not the hallmark finding.

9. Which RBC product specifically uses ADSOL with a 42-day shelf-life?

- A. Leukocyte- Reduced RBCs (CPDA- 35 days; ADSOL- 42 days)**
- B. Washed Red Cells (CPDA- 35 days)
- C. Packed RBCs (CPDA- 35 days; ADSOL- 42 days)
- D. Platelets (20-24 C; 5 days)

Storage of red blood cells in additive solutions can extend their shelf life from 35 days to 42 days. ADSOL is such an additive solution used with leukoreduced red blood cells, and this combination supports longer storage while also reducing risks from white cells. Therefore, the RBC product that specifically uses ADSOL with a 42-day shelf-life is the leukocyte-reduced red blood cells—these units are prepared with ADSOL and stored for up to 42 days. Washed red cells and other RBC products listed use CPDA-1 or different storage practices and do not carry the 42-day ADSOL extension; platelets have a distinct storage duration altogether.

10. Which statement about Enterococcus resistance is true?

- A. Enterococci are intrinsically resistant to many antibiotics, and some strains (E. faecalis and E. faecium) can acquire resistance.**
- B. Enterococci are susceptible to all antibiotics
- C. Enterococcus faecalis and faecium have no resistance
- D. Enterococcus is always vancomycin susceptible

Enterococcus species have intrinsic resistance to many antibiotics and can acquire additional resistance traits, which is what makes them a challenging pathogen. They naturally resist several common drugs, such as certain cephalosporins and display tolerance to others, and they can gain new resistance genes through horizontal gene transfer. A key example is the acquisition of van genes (like vanA or vanB) that confer vancomycin resistance, leading to vancomycin-resistant enterococci (VRE). This combination of inherent resistance plus the ability to pick up additional resistance explains why a statement describing Enterococcus as intrinsically resistant to many antibiotics and capable of acquiring resistance is true. The other ideas—uniform susceptibility to all antibiotics, no resistance in E. faecalis and E. faecium, or universal vancomycin susceptibility—don't fit clinical reality, since resistance, including vancomycin resistance, does occur.

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://uamsmltmls.examzify.com>

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

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