

Canadian Society for Medical Laboratory Science (CSMLS) 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. Which additive is in a gray stoppered blood tube?**
 - A. EDTA**
 - B. SPS**
 - C. Sodium citrate**
 - D. Sodium fluoride**

- 2. Oxygen transfers to tissues from blood primarily through which structure?**
 - A. Lymphatic vessels**
 - B. Arteries**
 - C. Arterioles**
 - D. Capillaries**

- 3. What should be the next step taken when a blood specimen and requisition do not match?**
 - A. Notify the nursing station to collect a new sample**
 - B. Notify the nursing station and proceed with testing**
 - C. Discard the specimen immediately**
 - D. Notify your supervisor immediately**

- 4. What occurs when urine is stored at room temperature?**
 - A. Turn alkaline**
 - B. Precipitate crystals**
 - C. Increase in bacterial count**
 - D. All the above**

- 5. What method is preferred for diluting strong acids?**
 - A. Mix strong acid with an equal amount of water**
 - B. Add strong acid to water gradually**
 - C. Always start with water**
 - D. Combine strong acid and base simultaneously**

- 6. What is the common term for a cerebrovascular accident?**
 - A. Heart attack**
 - B. Stroke**
 - C. Aneurysm**
 - D. Arrhythmia**

- 7. How should specimens for arterial blood gases determination be transported to the laboratory?**
- A. At body temperature**
 - B. In a freezer**
 - C. On ice**
 - D. Stab cell amount**
- 8. What is the function of a catalyst in an anaerobic jar?**
- A. Keeps excessive condensation from forming**
 - B. Keeps toxic levels of carbon dioxide from building up**
 - C. Only works properly when damp**
 - D. Combines residual oxygen with hydrogen to form water**
- 9. What is an example of a macroscopic examination in laboratory sciences?**
- A. Hematology analysis**
 - B. Gross pathology**
 - C. Cytology**
 - D. Serological testing**
- 10. Which step is out of order for histological processing?**
- A. Gross examination**
 - B. Decalcification**
 - C. Fixation**
 - D. Dehydration**

Answers

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

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Explanations

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1. Which additive is in a gray stoppered blood tube?

- A. EDTA
- B. SPS
- C. Sodium citrate
- D. Sodium fluoride**

The gray stoppered blood tube contains sodium fluoride as its additive. Sodium fluoride is primarily used for glucose preservation, which is critical in preventing glycolysis, the process where cells break down glucose and can lead to falsely low glucose levels in plasma or serum samples. This preservation is significant in laboratory settings, particularly when glucose testing is required after collection. The presence of sodium fluoride makes this tube optimal for tests that require accurate glucose levels, ensuring that any potential changes in the sample's composition due to cell metabolism are minimized. This specific functionality distinguishes it from other additives found in blood collection tubes.

2. Oxygen transfers to tissues from blood primarily through which structure?

- A. Lymphatic vessels
- B. Arteries
- C. Arterioles
- D. Capillaries**

Oxygen transfer to tissues from the blood occurs primarily through capillaries. Capillaries are the smallest blood vessels in the body and have walls that are only one cell thick. This thin structure facilitates the efficient exchange of gases, nutrients, and waste products between the blood and surrounding tissues. When blood reaches the capillaries, oxygen that is bound to hemoglobin in red blood cells diffuses out of the blood, across the capillary walls, and into the tissues where there is a lower concentration of oxygen. The close proximity of capillaries to nearly every cell in the body ensures that oxygen can be delivered effectively. The other choices represent different components of the circulatory system that are not primarily responsible for the direct transfer of oxygen to tissues. Lymphatic vessels are part of the immune system and involved in transporting lymph fluid, while arteries and arterioles are responsible for transporting blood away from the heart but do not facilitate the actual exchange of oxygen with tissues. The functionality of capillaries is crucial in ensuring that oxygen transfer occurs efficiently at the cellular level.

3. What should be the next step taken when a blood specimen and requisition do not match?

- A. Notify the nursing station to collect a new sample**
- B. Notify the nursing station and proceed with testing**
- C. Discard the specimen immediately**
- D. Notify your supervisor immediately**

In a scenario where a blood specimen and requisition do not match, the most appropriate next step is to notify the nursing station to collect a new sample. This action is critical because it ensures the integrity of the test results and patient safety. When mismatches occur, it raises concerns about the accuracy of the sample, which could lead to potential misdiagnosis or inappropriate treatment decisions. Collecting a new sample from the patient ensures that the laboratory has the correct specimen associated with the right patient information, thus maintaining the quality and reliability of laboratory testing. It also helps prevent confusion or errors later in the process, safeguarding overall workflow and patient care. Promptly notifying the nursing station allows for corrective steps to be taken while maintaining proper protocols, ensuring that the laboratory and nursing staff work collaboratively to address the issue efficiently.

4. What occurs when urine is stored at room temperature?

- A. Turn alkaline**
- B. Precipitate crystals**
- C. Increase in bacterial count**
- D. All the above**

When urine is stored at room temperature, a variety of biochemical and microbiological changes occur. First, the pH of the urine can shift, often leading to an alkaline environment. This change can result from the breakdown of urea into ammonia by bacteria, which can thrive in such conditions. Second, as bacteria multiply, they can lead to the precipitation of various salts and crystals. The rise in bacterial count is significant because it contributes to changes in urine composition, which can result in the formation of crystals that may not have been present initially. Lastly, the increase in bacterial count is a direct result of the favorable growth conditions (such as temperature and nutrient availability) in room temperature storage, leading to the potential for urinary tract infections and other complications if the urine is used for diagnostic purposes. Thus, the comprehensive impact of urine storage at room temperature includes the alteration of pH, the potential for crystal precipitation, and a rise in bacterial levels, supporting the idea that all these changes can occur under these conditions.

5. What method is preferred for diluting strong acids?

- A. Mix strong acid with an equal amount of water**
- B. Add strong acid to water gradually**
- C. Always start with water**
- D. Combine strong acid and base simultaneously**

The preferred method for diluting strong acids is to add the strong acid to water gradually. This technique is essential for safety reasons. When acid is mixed with water, it can release a significant amount of heat due to the exothermic reaction. If water is added to a strong acid, it can cause the solution to heat up rapidly, potentially leading to splattering or violent reactions, as the concentrated acid can cause the water to vaporize instantly. By adding the acid to water, the initial volume of water can absorb some of the heat, and the resulting mixture becomes less concentrated, reducing the risk of splattering and allowing for a safer dilution process. This approach also ensures that the acid is evenly mixed throughout the water as it is added, which helps control the heat generated during the dilution. Other methods, like mixing equal amounts or starting with water, do not prioritize safety and control in the same effective manner, while combining acid and base at the same time introduces additional risks due to the potential for rapid neutralization and heat production.

6. What is the common term for a cerebrovascular accident?

- A. Heart attack**
- B. Stroke**
- C. Aneurysm**
- D. Arrhythmia**

A cerebrovascular accident is commonly known as a stroke. This term refers to a medical condition that occurs when blood flow to a part of the brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. This can result in brain cells dying within minutes, leading to potential serious complications, including loss of function, disability, or even death. The term "stroke" can encompass different types of cerebrovascular accidents, including ischemic strokes, which occur due to a blockage in blood flow, and hemorrhagic strokes, which occur when a blood vessel in the brain bursts. Understanding this terminology is vital for healthcare professionals to communicate effectively about patients' conditions and the appropriate interventions required. The other options represent different medical conditions that do not relate to cerebrovascular accidents. A heart attack refers to the blockage of blood flow to the heart, an aneurysm is a bulge in a blood vessel that can potentially rupture, and arrhythmia refers to irregular heartbeats. Each of these terms pertains to distinct pathophysiological processes and systems in the body.

7. How should specimens for arterial blood gases determination be transported to the laboratory?

- A. At body temperature**
- B. In a freezer**
- C. On ice**
- D. Stab cell amount**

Specimens for arterial blood gases (ABG) determination must be transported on ice to ensure the most accurate results. When blood samples are exposed to room temperature, the metabolism of the cells continues, which can affect the levels of carbon dioxide and oxygen in the sample. This cellular metabolism can lead to a decrease in pH, increased carbon dioxide levels, and decreased oxygen levels, resulting in potentially misleading test results. Transporting the specimens on ice slows the metabolic process significantly. This chilled environment helps preserve the sample's integrity by minimizing changes in gas tensions, ultimately allowing for a more reliable assessment of respiratory and metabolic function. Other transportation methods, such as at body temperature or in a freezer, are unsuitable because body temperature can still lead to metabolic activity that alters the sample, while freezing can cause hemolysis or the formation of ice crystals that compromise the quality of the sample and the reliability of the results. Therefore, keeping the specimens on ice is the best practice for accurate ABG analysis.

8. What is the function of a catalyst in an anaerobic jar?

- A. Keeps excessive condensation from forming**
- B. Keeps toxic levels of carbon dioxide from building up**
- C. Only works properly when damp**
- D. Combines residual oxygen with hydrogen to form water**

A catalyst in an anaerobic jar plays a crucial role in the maintenance of anaerobic conditions by facilitating the chemical reaction that removes oxygen from the system. When residual oxygen is present in the jar, the catalyst promotes the reaction between this oxygen and hydrogen gas to form water. This reaction effectively decreases the oxygen concentration, which is essential for creating an environment suitable for the growth of anaerobic bacteria. The other options describe functions that do not accurately define the role of a catalyst in this context. For example, while keeping excessive condensation from forming is important for maintaining a stable environment, it is not the primary function of a catalyst. Similarly, preventing toxic levels of carbon dioxide is not a function attributed to the catalyst; rather, anaerobic jars typically rely on other mechanisms, like chemical reactions and gas absorption techniques, to manage gas levels. Lastly, while damp environments can influence the general effectiveness of reactions, a catalyst does not specifically require dampness to function in the context of reducing oxygen levels in the anaerobic jar.

9. What is an example of a macroscopic examination in laboratory sciences?

- A. Hematology analysis**
- B. Gross pathology**
- C. Cytology**
- D. Serological testing**

A macroscopic examination refers to the observation of structures or samples with the naked eye, without the aid of a microscope. This type of examination typically involves assessing size, shape, color, and texture of tissues or specimens, which can provide valuable initial insights into a sample's characteristics or the presence of disease. Gross pathology is the process where pathologists examine biological tissues, organs, or entire specimens, such as tumors or entire cadavers, to identify abnormalities. This type of examination is crucial for diagnosing diseases, understanding disease progression, and planning treatment strategies based on visible features. In contrast, hematology analysis, cytology, and serological testing are primarily microscopic or analytical techniques that require specialized equipment for detection and measurement. Hematology focuses on blood components usually viewed under a microscope, cytology examines single cells, often requiring staining and microscopy for proper assessment, while serological testing involves analyzing serum for antibodies or antigens, utilizing immunological techniques rather than direct visual assessment. Therefore, gross pathology stands out as a prime example of macroscopic examination in laboratory sciences.

10. Which step is out of order for histological processing?

- A. Gross examination**
- B. Decalcification**
- C. Fixation**
- D. Dehydration**

The process of histological processing involves a series of steps that are essential for preparing tissue samples for microscopic examination. In a typical histology workflow, the first step is fixation, which preserves the tissue structure by preventing degradation and autolysis. Following fixation, the samples undergo a gross examination to assess the condition of the tissue and plan for further processing. Decalcification is a necessary procedure for samples containing bone or calcified tissue, which typically occurs before dehydration. Dehydration is the next step that removes water from the tissue, preparing it for infiltration with paraffin or embedding media. Therefore, decalcification should happen prior to dehydration when calcified tissues are involved. Thus, placing decalcification in an incorrect sequence in the processing workflow disrupts the logical order necessary for effective histological preparation, making it the out-of-order step in this list.

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://csmls.examzify.com>

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

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