# CSMLS Medical Laboratory Assistants (MLA) Practice Exam (Sample)

## Study Guide


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# Questions

**1. Which factor is least likely to affect the quality of urine samples?**

**A. Type of container used**

**B. The procedure for collection**

**C. Presence of preservatives**

**D. Time of day urine is collected**

**2. How should 10% NBF be disposed of?**

**A. Pour down the sink after dilution**

**B. Neutralized and disposed separately**

**C. Discard without special handling**

**D. Incinerate with other waste**

**3. If an error occurs during specimen preparation, at which stage can it not be rectified?**

**A. Embedding**

**B. Fixation**

**C. Sectioning**

**D. Mounting**

**4. If neutrophils in a Gram stain are not pink, what has likely occurred?**

**A. They were overdecolorized**

**B. They were underdecolorized**

**C. They were diluted**

**D. They were improperly fixed**

**5. Which of the following is considered biological waste?**

**A. Household waste**

**B. Human blood and body fluid waste**

**C. Plastic packaging waste**

**D. Office trash**

**6. True or False: If a CSF specimen cannot be processed immediately, it should be refrigerated.**

**A. True**

**B. False**

**C. Only if the delay is over 2 hours**

**D. It can be stored at room temperature**

**7. Which specimen would you expect to have a non-clotted characteristic?**

**A. Whole blood**

**B. Serum**

**C. Plasma**

**D. Cerebrospinal fluid**

**8. What are the two most common collection errors in blood draws?**

**A. Improper labeling and contamination**

**B. Under filling and inadequate mixing**

**C. Incorrect venipuncture and improper tourniquet use**

**D. Missing signature and wrong patient**

**9. Why might some lids on fungal cultures be taped?**

**A. To increase oxygen exposure**

**B. To reduce moisture loss**

**C. Some fungi are lifters**

**D. To prevent contamination**

**10. Which of the following types of bacteria requires increased carbon dioxide for optimal growth?**

**A. Microaerophiles**

**B. Capnophiles**

**C. Anaerobes**

**D. Facultative anaerobes**

# Answers

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

# Explanations

## 1. Which factor is least likely to affect the quality of urine samples?

**A. Type of container used**

**B. The procedure for collection**

**C. Presence of preservatives**

**D. Time of day urine is collected**

**The correct answer indicates that the time of day urine is collected is least likely to affect the overall quality of urine samples. While the timing can influence certain specific analyses, such as hormone levels or osmolality, it is less critical compared to other factors in ensuring a high-quality sample. The type of container used plays a significant role in urine quality, as inappropriate materials can interact with urine components, potentially leading to contamination or alteration of test results. Similarly, the procedure for collection is crucial; improper techniques can lead to contamination from the genital area or discrepancies in sample composition. The presence of preservatives is vital for stabilizing components in the urine and preventing degradation during transport and storage. Thus, while the time of day can impact certain analyses, it is not as fundamental to the overall quality assurance of urine samples as the other factors listed.**

## 2. How should 10% NBF be disposed of?

**A. Pour down the sink after dilution**

**B. Neutralized and disposed separately**

**C. Discard without special handling**

**D. Incinerate with other waste**

**Disposing of 10% Neutral Buffered Formalin (NBF) requires special handling due to its hazardous nature. Formalin is a solution that contains formaldehyde, which is classified as a known carcinogen and can pose significant health risks to both individuals and the environment. In the correct approach, neutralizing NBF prior to disposal is essential. This process typically involves treating the formaldehyde in the solution to render it less hazardous, which allows for safe disposal in accordance with health and environmental regulations. The neutralized waste can then be handled in a manner that minimizes risks to public safety and ecological harm. This careful disposal method ensures compliance with safety protocols that mandate the proper handling of hazardous materials, protecting not only the personnel involved in the disposal but also the broader community and environment from potential contamination or exposure to harmful substances.**

## 3. If an error occurs during specimen preparation, at which stage can it not be rectified?

**A. Embedding**

**B. Fixation**

**C. Sectioning**

**D. Mounting**

**In the context of specimen preparation, fixation is a critical step that cannot be undone. This stage involves the chemical preservation of tissues, ensuring that cellular structures are stabilized and maintained for microscopic examination. Once fixation has occurred, the chemical changes that take place in the tissue cannot be reversed. It essentially 'locks in' the sample's structure at the time of fixation, preventing any further alterations or corrections to be made to the specimen in subsequent stages. Embedding, sectioning, and mounting, while important processes in specimen preparation, allow for some degree of correction or adjustment. For example, if issues arise during embedding, the specimen can often be re-embedded properly. Similarly, sectioning allows for adjustments to be made if the initial cuts are not satisfactory, and mounting can be redone if there are problems with slides. Therefore, fixation represents the point of no return in the specimen preparation process, as it permanently alters the tissue, making it impossible to rectify any errors that may have occurred prior to this stage.**

## 4. If neutrophils in a Gram stain are not pink, what has likely occurred?

**A. They were overdecolorized**

**B. They were underdecolorized**

**C. They were diluted**

**D. They were improperly fixed**

**When neutrophils in a Gram stain are not pink, it indicates that they are not properly displaying the expected reaction to the Gram-staining procedure. The pink color in a Gram stain is typically associated with Gram-negative bacteria, which retain the counterstain (usually safranin) after the decolorization step. In the context of this question, if neutrophils are not pink, it suggests that they might not have undergone sufficient decolorization. In a Gram stain, the decolorization process is critical because it differentiates between Gram-positive and Gram-negative bacteria based on the thickness of their peptidoglycan layer. If a sample is underdecolorized, Gram-negative cells will retain the primary stain (crystal violet) and may not appear pink; they would instead remain purple. Therefore, the neutrophils may still appear purple if they are associated with Gram-negative bacteria that were not decolorized properly. In this scenario, underdecolorization would result in the retention of the crystal violet stain, leading to misinterpretation of the cell types. This understanding highlights the importance of carefully timing the decolorization process to achieve accurate results in microscopic examination and bacterial identification.**

## 5. Which of the following is considered biological waste?

**A. Household waste**

**B. Human blood and body fluid waste**

**C. Plastic packaging waste**

**D. Office trash**

**Biological waste refers to any waste that originates from a living organism, specifically waste that poses a risk of infection or contamination. Human blood and body fluid waste falls squarely within this definition, as it can contain pathogens that may pose a health risk to individuals handling it or to the environment if not disposed of properly. This type of waste must be handled, stored, and disposed of according to strict regulations to ensure safety in medical and laboratory environments. In contrast, household waste, plastic packaging waste, and office trash do not fall under the category of biological waste, as they do not contain human or animal tissues or bodily fluids that could transmit infectious agents. Therefore, the correct identification of human blood and body fluid waste as biological waste is critical for maintaining health and safety standards in laboratory and clinical settings.**

## 6. True or False: If a CSF specimen cannot be processed immediately, it should be refrigerated.

**A. True**

**B. False**

**C. Only if the delay is over 2 hours**

**D. It can be stored at room temperature**

**The correct response to whether a cerebrospinal fluid (CSF) specimen should be refrigerated if it cannot be processed immediately is that it should indeed not be refrigerated. CSF specimens are highly sensitive to changes in temperature, and refrigeration can potentially compromise the integrity of the sample and affect the results of various tests. Instead, CSF specimens should be kept at room temperature if processing cannot occur right away. This is crucial to maintain the viability of any cellular components and biochemical substances present in the sample. Immediate processing or proper storage conditions are vital for accurate diagnostic testing, as there are specific time-sensitive factors involved in different analyses of CSF. Therefore, maintaining the sample at room temperature helps to prevent cellular degradation and preserves the quality of the specimen for testing.**

## 7. Which specimen would you expect to have a non-clotted characteristic?

**A. Whole blood**

**B. Serum**

**C. Plasma**

**D. Cerebrospinal fluid**

**The specimen that would have a non-clotted characteristic is cerebrospinal fluid. This fluid is crucial for protecting the brain and spinal cord and does not undergo a clotting process like blood does. Cerebrospinal fluid is collected through a procedure called a lumbar puncture and is typically clear and free-flowing, allowing for its diagnostic use in identifying various medical conditions, such as infections or neurological disorders. Whole blood, serum, and plasma all originate from blood; however, they behave differently in terms of clotting. Whole blood contains both cellular components and plasma but has not been allowed to clot. Plasma is the liquid portion of blood that has been anti-coagulated, and it contains clotting factors. Serum is obtained after blood has clotted and the clot has been removed, thus lacking clotting factors. Therefore, cerebrospinal fluid is the only option presented that inherently remains in a non-clotted state, directly reflecting its physiological role and collection method.**

## 8. What are the two most common collection errors in blood draws?

**A. Improper labeling and contamination**

**B. Under filling and inadequate mixing**

**C. Incorrect venipuncture and improper tourniquet use**

**D. Missing signature and wrong patient**

**The selection of under filling and inadequate mixing as the two most common collection errors in blood draws highlights significant factors that can affect the quality and reliability of laboratory results. Under filling occurs when the blood collection tube is not filled to the required volume, which can compromise the analysis. This is particularly crucial for tests that require a specific blood-to-additive ratio, such as coagulation tests. Insufficient volume can lead to inaccurate results, necessitating the recollection of the sample. Inadequate mixing refers to the process of ensuring that the blood and any additives in the collection tube are thoroughly mixed. For instance, in tubes containing anticoagulants, it is imperative to mix the sample immediately after collection to prevent clotting. Failing to do so can result in hemolysis or clot formation, skewing test results and potentially leading to misdiagnosis or incorrect treatment. Overall, both under filling and inadequate mixing are critical considerations for laboratory assistants and phlebotomists to ensure accurate and reliable patient results. By focusing on these aspects, it becomes clear that correct techniques during the collection process are fundamental to the integrity of laboratory diagnostics.**

## 9. Why might some lids on fungal cultures be taped?

**A. To increase oxygen exposure**

**B. To reduce moisture loss**

**C. Some fungi are lifters**

**D. To prevent contamination**

**Taping the lids on fungal cultures is primarily done to prevent contamination. In laboratory settings, it is critical to maintain the integrity of a culture by minimizing the risk of unintended organisms entering the medium. Taping the lid helps secure the environment and protects the culture from exposure to airborne contaminants such as bacteria, mold spores, and other fungi that may compromise the purity and accuracy of the results. Fungi, including those used in research and clinical diagnostics, can come from the environment, making it essential to seal cultures to ensure that they reflect the growth of the intended organism. This practice is especially important in mycology, where various contaminants could easily outcompete the fungi of interest if not properly managed. While some options touch on relevant aspects of fungal culture management, such as moisture and oxygen levels, the action of taping the lids is most directly associated with contamination prevention.**

## 10. Which of the following types of bacteria requires increased carbon dioxide for optimal growth?

**A. Microaerophiles**

**B. Capnophiles**

**C. Anaerobes**

**D. Facultative anaerobes**

**Bacteria that require increased carbon dioxide for optimal growth are referred to as capnophiles. These organisms thrive in environments where carbon dioxide concentrations are higher than what is normally found in the atmosphere, typically around 5-10% $CO_2$, compared to the atmospheric level of about 0.03%. The increased carbon dioxide can be crucial for their metabolic processes, influencing factors such as respiration and fermentation. Microaerophiles are a category of bacteria that require reduced levels of oxygen (typically around 2-10%) for growth and may not necessarily prefer elevated levels of carbon dioxide. Anaerobes are organisms that do not require oxygen for growth, and while some may tolerate certain carbon dioxide levels, they primarily thrive in environments devoid of oxygen. Facultative anaerobes can grow in both the presence and absence of oxygen and can adapt their metabolism accordingly but do not specifically require high carbon dioxide concentrations for optimal growth. Thus, the defining characteristic of capnophiles makes them the correct answer, as they specifically flourish in higher levels of carbon dioxide, contrasting with the requirements of the other bacterial types mentioned.**