

PLTW Biomedical Science Practice Test (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

- 1. What does the occipital lobe do?**
 - A. Controls emotions and desires**
 - B. Processes sensory nerve impulses from the eyes**
 - C. Coordinates movement and balance**
 - D. Manages long-term memory storage**
- 2. What phenomenon occurs due to the pooling of blood after death?**
 - A. Rigor mortis**
 - B. Decomposition**
 - C. Liver mortis**
 - D. Coding**
- 3. How are forensic chemists and forensic toxicologists similar?**
 - A. Both study organic compounds**
 - B. Both analyze chemical substances in criminal cases**
 - C. Both focus on the physical evidence at crime scenes**
 - D. Both diagnose diseases in living organisms**
- 4. In epidemiology, what is primarily studied?**
 - A. The effectiveness of new pharmaceuticals**
 - B. The distribution of health-related events in populations**
 - C. The psychological traits of healthy individuals**
 - D. The nutritional habits of patients**
- 5. What does the mechanism of death refer to?**
 - A. The injury that caused death**
 - B. The external factors surrounding death**
 - C. What happens inside the body to cause death**
 - D. The legal classification of death**
- 6. How does cortisol affect the body's response to stress?**
 - A. It increases appetite for sugary foods**
 - B. It suppresses immune function**
 - C. It triggers sleepiness immediately**
 - D. It enhances muscular strength**

- 7. How could an individual lose their sight or hearing without direct damage to their sensory organs?**
- A. By not receiving enough light or sound**
 - B. By damaging the part of the brain that controls those functions**
 - C. By having a genetic predisposition**
 - D. By developing a psychological disorder**
- 8. Which aspect of biology does bioinformatics specifically apply technology to?**
- A. Anatomy studies**
 - B. Physical training**
 - C. Genomic data analysis**
 - D. Ecological research**
- 9. How long does it take for fly eggs to become larva?**
- A. 24 hours**
 - B. 48 hours**
 - C. 72 hours**
 - D. 12 hours**
- 10. How does the incomplete development of the frontal lobe in teenagers affect their behavior?**
- A. They have improved decision-making abilities**
 - B. They may struggle with controlling emotions and behaviors**
 - C. They are less likely to take risks**
 - D. They show increased empathy toward others**

Answers

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

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Explanations

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1. What does the occipital lobe do?

- A. Controls emotions and desires
- B. Processes sensory nerve impulses from the eyes**
- C. Coordinates movement and balance
- D. Manages long-term memory storage

The occipital lobe is primarily responsible for processing visual information. It receives sensory nerve impulses from the eyes and interprets them to allow the brain to understand what is seen. This includes recognition of shapes, colors, and movement, as well as spatial awareness and coordination of visual stimuli. The functionality of the occipital lobe is critical for visual perception, making it an essential component of the brain's ability to interpret the environment through sight. Other functions such as controlling emotions, managing memory storage, and coordinating movement are primarily associated with different brain regions. The emotional and desire-related functions are generally linked to the limbic system, while movement and balance coordination involve the cerebellum and motor areas of the brain. Long-term memory is mostly managed by structures such as the hippocampus and the surrounding areas in the medial temporal lobe. Therefore, the occipital lobe's unique specialization in visual processing makes it the correct answer for this question.

2. What phenomenon occurs due to the pooling of blood after death?

- A. Rigor mortis
- B. Decomposition
- C. Liver mortis**
- D. Coding

The pooling of blood after death leads to a phenomenon known as liver mortis, also referred to as postmortem hypostasis. This occurs due to the force of gravity acting on the blood, which begins to settle in the lower parts of the body, resulting in a purplish discoloration of the skin in those areas. This process can begin within minutes to a couple of hours after death and may become more pronounced over time. Liver mortis is crucial in forensic science because it can provide information about the time of death and the position of the body at the time of death. Once this process sets in, it is a strong indicator that the individual has passed away. Recognizing liver mortis can assist forensic investigators in establishing timelines during their examinations. The other phenomena, while related to the postmortem process, do not specifically relate to blood pooling. Rigor mortis involves the stiffening of muscles post-death, decomposition refers to the biological breakdown of the body over time, and coding is not a term related to postmortem changes. Understanding liver mortis helps build a comprehensive picture of the events following death.

3. How are forensic chemists and forensic toxicologists similar?

- A. Both study organic compounds
- B. Both analyze chemical substances in criminal cases**
- C. Both focus on the physical evidence at crime scenes
- D. Both diagnose diseases in living organisms

Forensic chemists and forensic toxicologists are similar in that both professions are involved in the analysis of chemical substances pertaining to criminal cases. This commonality is fundamental to their roles, as both fields require a deep understanding of chemistry and involve investigative work that supports legal proceedings. Forensic chemists typically analyze various materials to identify substances that may be relevant to a crime, such as drugs, explosives, or other materials found at a crime scene. They utilize various techniques to determine the composition of these materials and how they may relate to criminal activities. Forensic toxicologists, on the other hand, specifically focus on the effects of chemicals, particularly drugs and poisons, on the human body. They often conduct analyses of biological samples (like blood or urine) to determine if substances contributed to the outcome of a case, such as a death, injury, or impaired behavior. While they may employ different techniques and focus on different aspects of evidence, their common goal of analyzing chemical substances to provide insights into criminal cases highlights their similarity in the forensic sciences.

4. In epidemiology, what is primarily studied?

- A. The effectiveness of new pharmaceuticals
- B. The distribution of health-related events in populations**
- C. The psychological traits of healthy individuals
- D. The nutritional habits of patients

In the field of epidemiology, the primary focus is on the distribution of health-related events in populations. This encompasses understanding how diseases spread, the factors that influence health outcomes, and the demographics most affected by certain health issues. Epidemiologists analyze patterns, causes, and effects of health and disease conditions in defined populations, which helps to inform public health strategies and interventions aimed at improving health outcomes. On the other hand, while the effectiveness of new pharmaceuticals plays an important role in health care, it falls more under pharmacology and clinical research rather than the core aim of epidemiology. Similarly, studying the psychological traits of healthy individuals involves aspects of psychology and behavioral health, not the epidemiological focus on populations and health events. Lastly, nutritional habits of patients would be significant in nutritional science and dietetics; although it is relevant to public health, it is not the primary study focus of epidemiology, which emphasizes the broader patterns and determinants of health within populations.

5. What does the mechanism of death refer to?

- A. The injury that caused death**
- B. The external factors surrounding death**
- C. What happens inside the body to cause death**
- D. The legal classification of death**

The mechanism of death refers specifically to the physiological or biological process that ultimately leads to death. This includes the internal events or changes within the body, such as cardiac arrest, respiratory failure, or organ failure, that occur as a result of the cause of death. The mechanism is the underlying process that explains how the injury or disease leads to the cessation of life. Understanding this concept is crucial in biomedical science and forensic analysis, as it helps professionals determine how and why a patient or individual has died based on the bodily responses to various health conditions or external factors.

6. How does cortisol affect the body's response to stress?

- A. It increases appetite for sugary foods**
- B. It suppresses immune function**
- C. It triggers sleepiness immediately**
- D. It enhances muscular strength**

Cortisol, often referred to as the "stress hormone," plays a significant role in the body's response to stress. When faced with a stressor, the body releases cortisol to help manage and respond to the situation effectively. One of the critical functions of cortisol is its ability to suppress immune function. This suppression is not merely detrimental; it is part of a larger strategy to redirect energy and resources towards survival mechanisms rather than immune responses, which can take time and energy to mount. When cortisol levels rise, it helps to limit inflammation and can prevent the immune system from overreacting, which could be harmful in the context of stress. Understanding this mechanism is essential for recognizing how prolonged exposure to high levels of cortisol, often due to chronic stress, can lead to weakened immune responses, making the body more susceptible to infections and diseases. Thus, the impact of cortisol on immune function is a crucial aspect of its role in the body's overall stress response.

7. How could an individual lose their sight or hearing without direct damage to their sensory organs?

A. By not receiving enough light or sound

B. By damaging the part of the brain that controls those functions

C. By having a genetic predisposition

D. By developing a psychological disorder

The correct choice highlights the importance of the brain's role in processing sensory information. Even if the sensory organs themselves—the eyes or ears—are functioning normally, damage to the areas of the brain that are responsible for interpreting visual or auditory signals can result in loss of sight or hearing. These areas include the occipital lobe for vision and the temporal lobe for hearing. If the brain cannot process the stimuli received from functioning sensory organs due to injury, disease, or other factors, the individual may experience dysfunction in sight or hearing. The other options present scenarios that, while they can affect perception, do not illustrate how loss might occur without damage to the sensory organs themselves. For instance, not receiving enough light or sound relates to the stimulation of sensory organs rather than brain processing. Genetic predispositions may contribute to susceptibility to certain conditions but do not directly explain the loss of function in the absence of sensory organ damage. Psychological disorders can indeed impact perception, yet they do so through different pathways and may involve the interpretation of sensory input rather than direct processing loss in the brain regions designed for those functions.

8. Which aspect of biology does bioinformatics specifically apply technology to?

A. Anatomy studies

B. Physical training

C. Genomic data analysis

D. Ecological research

Bioinformatics applies technology specifically to genomic data analysis, which involves the use of computational tools to manage and analyze biological data, particularly data related to genomes. This field encompasses the organization, analysis, and visualization of genetic information, allowing researchers to decode complex biological phenomena at the molecular level. In genomic data analysis, bioinformatics plays a crucial role in processing large amounts of sequence data generated by high-throughput sequencing technologies. It helps in identifying genes, understanding their functions, comparing genomes, and exploring genetic variation among populations or species. This powerful combination of biology and technology enables scientists to uncover genetic relationships and mechanisms underlying various biological processes and diseases. The other options represent areas of biology that do not focus primarily on the analysis of genomic data. Anatomy studies are concerned with the structure of organisms, physical training pertains to fitness and exercise physiology, and ecological research focuses on interactions between organisms and their environments. While all these areas are valuable in the biological sciences, they do not engage with the computational methods and large datasets characteristic of bioinformatics.

9. How long does it take for fly eggs to become larva?

- A. 24 hours**
- B. 48 hours**
- C. 72 hours**
- D. 12 hours**

The correct answer is that it takes approximately 24 hours for fly eggs to develop into larvae, commonly known as maggots. This rapid development is part of the life cycle of many fly species, particularly the common housefly. After the female fly lays her eggs, the eggs undergo a process of embryonic development and hatch into larvae within this short time frame. Warm environments can expedite this process, as flies thrive in warmer conditions, which can quicken the hatching time. The quick transition from egg to larva is essential for flies because it allows them to take advantage of available resources in their environment, such as decaying organic matter, which is crucial for their growth and further development into adult flies. The other time frames provided in the choices do not accurately reflect the typical duration for this particular stage in the fly life cycle, making 24 hours the most accurate and recognized timeframe.

10. How does the incomplete development of the frontal lobe in teenagers affect their behavior?

- A. They have improved decision-making abilities**
- B. They may struggle with controlling emotions and behaviors**
- C. They are less likely to take risks**
- D. They show increased empathy toward others**

The incomplete development of the frontal lobe in teenagers has a significant impact on their behavior, particularly in terms of emotional regulation and impulse control. The frontal lobe is responsible for executive functions, which include decision-making, planning, and controlling social behavior. Since this area of the brain is still maturing during the teenage years, individuals may find themselves struggling to manage their emotions effectively. This can lead to impulsive actions or difficulty in understanding the consequences of their behavior, resulting in actions that might seem reckless or socially inappropriate. Additionally, teenagers may exhibit heightened emotional responses or outbursts, as their ability to evaluate situations critically and modulate their reactions is still developing. This phenomenon is often observed in various settings, such as at school or in social interactions, where the challenges of navigating complex emotional landscapes can be particularly pronounced. Hence, the behavior of teenagers can often reflect this ongoing maturation process, highlighting the importance of understanding the developmental stages of the brain when considering their actions.

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://pltwbiomedscience.examzify.com>

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