

# PLTW MEDICAL DETECTIVES PRACTICE EXAM (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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<https://pltwmedicaldetectives.examzify.com>



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# Table of Contents

|                             |    |
|-----------------------------|----|
| Copyright .....             | 1  |
| Table of Contents .....     | 2  |
| Introduction .....          | 3  |
| How to Use This Guide ..... | 4  |
| Questions .....             | 5  |
| Answers .....               | 8  |
| Explanations .....          | 10 |
| Next Steps .....            | 15 |

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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 condition results from rupture or obstruction of a brain vessel and causes sudden loss of consciousness and function?**
  - A. Stroke
  - B. Heart attack
  - C. Epilepsy
  - D. Migraine
- 2. Which term describes the amount of heat that the body produces and releases?**
  - A. Temperature
  - B. Pulse
  - C. Blood pressure
  - D. Respiratory rate
- 3. Which term best describes the set of measurements indicating the body's essential functions?**
  - A. Vital signs
  - B. Pulse
  - C. Temperature
  - D. Blood pressure
- 4. The term for a structured approach to planning experiments to investigate scientific questions is?**
  - A. Experimental design
  - B. Valid
  - C. Experiments
  - D. Independent Variable
- 5. The variable that is manipulated or changed in an experiment is known as the?**
  - A. Independent variable
  - B. Dependent variable
  - C. Pulse
  - D. Temperature

- 6. Which brain region is described as having roles in behavior and personality, planning, initiated movements, social and emotional processing, and attention, as well as memory retrieval and storage?**
- A. Frontal lobes
  - B. Parietal lobes
  - C. Temporal lobes
  - D. Occipital lobes
- 7. What does hemorrhage mean?**
- A. Bleeding or excessive bleeding.
  - B. Inflammation of the liver.
  - C. A rapid heart rate.
  - D. Blockage of a blood vessel.
- 8. Which postmortem change is most useful for estimating the body's position at death?**
- A. Livor mortis
  - B. Algor mortis
  - C. Rigor mortis
  - D. Perimortem injury
- 9. What does PCR stand for and what is its basic purpose?**
- A. Polymerase chain reaction; to amplify small quantities of DNA for analysis.
  - B. Protein chain reaction; to express proteins.
  - C. Polymerase cyclic reaction; to replicate RNA.
  - D. Polymerase chain reaction; to separate DNA fragments by size.
- 10. Which statement correctly describes qualitative data in lab results?**
- A. Qualitative data describe what is present.
  - B. Qualitative data describe how much.
  - C. Qualitative data are used to calibrate instruments.
  - D. Qualitative data are numerical.

## **Answers**

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

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## **Explanations**

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**1. Which condition results from rupture or obstruction of a brain vessel and causes sudden loss of consciousness and function?**

**A. Stroke**

B. Heart attack

C. Epilepsy

D. Migraine

*A cerebrovascular event occurs when a brain vessel ruptures or becomes obstructed, cutting off blood flow to part of the brain. When blood flow is interrupted, brain cells die quickly, leading to sudden loss of consciousness and neurological deficits such as weakness, trouble speaking, or vision changes. This is a stroke, which can be ischemic (a clot blocking a vessel) or hemorrhagic (a vessel rupture with bleeding). The description in the question matches stroke because the underlying issue is a rupture or blockage of a brain vessel causing abrupt loss of brain function. Heart attack involves the heart, epilepsy is a problem with brain electrical activity, and migraines are typically headaches and related symptoms rather than a sudden loss of consciousness from a brain vessel event.*

**2. Which term describes the amount of heat that the body produces and releases?**

**A. Temperature**

B. Pulse

C. Blood pressure

D. Respiratory rate

*Understanding body heat levels is essential: the amount of heat the body produces and loses determines what we measure as temperature. Temperature is the reading that reflects how hot or cold the body is, balancing metabolic heat production with heat loss to the environment through the skin, lungs, and sweating. The body keeps this measurement within a narrow range (about 37°C or 98.6°F on average) through mechanisms controlled by the hypothalamus acting like a thermostat. When metabolic activity increases heat production and loss mechanisms can't keep up, temperature rises, leading to fever. If heat loss outpaces production, temperature drops. Other terms describe different bodily functions, not heat balance. Pulse measures heart rate, blood pressure reflects the force of blood in the arteries, and respiratory rate counts breaths per minute.*

**3. Which term best describes the set of measurements indicating the body's essential functions?**

**A. Vital signs**

B. Pulse

C. Temperature

D. Blood pressure

*Vital signs describe the set of measurements that reflect the body's essential functions. They provide a quick snapshot of how the body is doing and are used to judge stability. The main components typically include pulse (heart rate), respiratory rate, temperature, and blood pressure. In this question, the term that best captures the whole group of these measurements is vital signs. The other options—the pulse, temperature, and blood pressure—are individual measurements that are part of the vital-sign set, not the set as a whole.*

**4. The term for a structured approach to planning experiments to investigate scientific questions is?**

- A. Experimental design**
- B. Valid
- C. Experiments
- D. Independent Variable

*Experimental design is the structured plan you use to run experiments in a way that can reliably answer a scientific question. It involves deciding what to test, which variables to compare, how to control other factors, how many samples to study, and how you'll collect and analyze the data. This planning helps ensure that any observed differences are due to the factor you're investigating, not random variation or other influences, making the results trustworthy and reproducible. The term described here refers to this overall approach to arranging and conducting the investigation. The word "valid" is not the name of a planning framework, "experiments" describe the activities themselves rather than the planning process, and the independent variable is the factor you change within the design, not the entire planning framework.*

**5. The variable that is manipulated or changed in an experiment is known as the?**

- A. Independent variable**
- B. Dependent variable
- C. Pulse
- D. Temperature

*In an experiment, you decide what to change to test its effect. The factor you deliberately alter is called the independent variable. The outcome you measure in response to that change is the dependent variable. For example, if you study how temperature affects reaction rate, you would set the temperature (the manipulated factor) and then observe how fast the reaction occurs (the result). Here, the manipulated variable is the independent variable; terms like pulse or temperature are specific measurements that could either be manipulated or measured depending on the study, but they're not the general name for the factor you change.*

**6. Which brain region is described as having roles in behavior and personality, planning, initiated movements, social and emotional processing, and attention, as well as memory retrieval and storage?**

- A. Frontal lobes**
- B. Parietal lobes
- C. Temporal lobes
- D. Occipital lobes

*The frontal lobes coordinate high-level thinking and action. They're where planning, decision making, and the ability to organize behavior come together, and they also house the brain's controls for initiating voluntary movements through the motor planning areas and primary motor cortex. Regions within the frontal lobes, like the orbitofrontal and medial prefrontal areas, shape personality and govern social and emotional behavior. Attention and working memory rely on the frontal lobes as they manage focus, control cognitive resources, and use retrieval strategies. While the hippocampus and temporal areas store memories, the frontal lobes play a crucial role in retrieving and organizing those memories, guiding how we use them. So, the described mix of behavior and personality, planning, initiated movement, social and emotional processing, attention, and memory retrieval aligns with the frontal lobes.*

## 7. What does hemorrhage mean?

- A. Bleeding or excessive bleeding.
- B. Inflammation of the liver.
- C. A rapid heart rate.
- D. Blockage of a blood vessel.

*Hemorrhage means bleeding, especially sudden or excessive bleeding from a ruptured blood vessel. This directly defines the term, making it the best answer. Inflammation of the liver describes hepatitis, not bleeding. A rapid heart rate is tachycardia, a different physiologic change. Blockage of a blood vessel refers to occlusion or embolism, which stops flow rather than describes bleeding from vessels. In practice, hemorrhage can be external or internal and can range from mild to life-threatening.*

## 8. Which postmortem change is most useful for estimating the body's position at death?

- A. Livor mortis
- B. Algor mortis
- C. Rigor mortis
- D. Perimortem injury

*Postmortem lividity shows where blood settled under gravity after death, so the areas of the body that become discolored indicate the parts that were lowest when death occurred. This pattern reveals how the body was oriented at the moment of death, and changes or fixed lividity can also hint at whether the body was moved after death. Algor mortis relates to cooling, not position; rigor mortis describes muscle stiffening useful for timing rather than orientation; and perimortem injury concerns injuries around the time of death, not where the body lay.*

## 9. What does PCR stand for and what is its basic purpose?

- A. Polymerase chain reaction; to amplify small quantities of DNA for analysis.
- B. Protein chain reaction; to express proteins.
- C. Polymerase cyclic reaction; to replicate RNA.
- D. Polymerase chain reaction; to separate DNA fragments by size.

*PCR stands for polymerase chain reaction, and its basic purpose is to amplify small quantities of DNA for analysis. It uses a heat-stable DNA polymerase and cycles of heating and cooling to denature the DNA, allow primers to bind to the target sequence, and extend new DNA strands, doubling the amount of target DNA with each cycle. This exponential amplification lets scientists detect, analyze, or compare DNA even when starting material is tiny, which is crucial in pathogen identification, forensic work, and genetic testing. The other ideas don't fit: one suggests expressing proteins, which isn't what PCR does; another implies a cyclic reaction to copy RNA, whereas standard PCR targets DNA (though RNA samples can be converted to DNA in related methods); and one describes separating DNA by size, a function of gel electrophoresis rather than amplification.*

**10. Which statement correctly describes qualitative data in lab results?**

- A. Qualitative data describe what is present.**
- B. Qualitative data describe how much.
- C. Qualitative data are used to calibrate instruments.
- D. Qualitative data are numerical.

*Qualitative data are descriptive observations about what is present in a sample, not quantities. In lab results, they describe identity or properties—such as color change, presence or absence of a substance, or a visible trait—without assigning a numeric value. That makes describing what is present the best choice, because qualitative data capture categorical, descriptive information rather than amounts. The idea of how much would be quantitative data, which uses numbers; calibrating instruments typically relies on numerical standards, not just descriptive presence or absence. Qualitative data are not numerical by themselves.*

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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](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://pltwmedicaldetectives.examzify.com>

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

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