

SEPTA Electrician Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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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 NEC article covers fire-alarm systems?**
 - A. NEC Article 110**
 - B. NEC Article 760**
 - C. NEC Article 250**
 - D. NEC Article 300**

- 2. Which design feature of transformer cores helps reduce energy losses due to eddy currents?**
 - A. Solid Steel**
 - B. Laminated Steel**
 - C. Copper**
 - D. Air Core**

- 3. If kilowatts are known, which expression gives current in a three-phase system?**
 - A. $I = KW \times 1000 / Volts \times PF \times 1.73$**
 - B. $I = KW \times 1000 / (Volts \times PF \times 1.73)$**
 - C. $I = KW \times 1000 / Volts \times PF \times 1.73$**
 - D. $I = KW \times 1000 / Volts \div (PF \times 1.73)$**

- 4. What are the common types of AC motors?**
 - A. DC motors and servo motors**
 - B. Induction motors and synchronous motors**
 - C. Universal motors and stepper motors**
 - D. Reluctance motors and hysteresis motors**

- 5. What term is defined as electrical potential, electrical pressure?**
 - A. Voltage**
 - B. Current**
 - C. Resistance**
 - D. Grounding**

- 6. Which motor requires an inverter to operate?**
- A. AC traction motor**
 - B. DC traction motor**
 - C. Inverter**
 - D. Battery system**
- 7. Which motor type generally has lower maintenance due to no brushes?**
- A. DC Motors**
 - B. Synchronous Motors**
 - C. AC Motors**
 - D. Induction Motors**
- 8. Which tool is used to bend EMT and other conduit?**
- A. Wire strippers**
 - B. Conduit bender**
 - C. Multimeters**
 - D. Fish tape**
- 9. Frequency units?**
- A. Amperes**
 - B. Volts**
 - C. Hz**
 - D. Ohms**
- 10. What is needed for speed control of AC motors?**
- A. A simple resistor network**
 - B. Frequency converters and variable frequency drives**
 - C. Solar panels**
 - D. Gearbox adjustments**

Answers

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

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Explanations

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1. Which NEC article covers fire-alarm systems?

- A. NEC Article 110
- B. NEC Article 760**
- C. NEC Article 250
- D. NEC Article 300

Fire-alarm systems are covered by Article 760. This article specifically lays out the rules for fire alarm components—initiating devices, notification appliances, power supplies, and the wiring and installation requirements that ensure life-safety systems operate reliably during a fire. It addresses circuit supervision, standby power, and the unique signaling needs of fire protection systems, which is why it's the focus for fire-alarm topics. The other articles deal with different areas: general electrical installation requirements and safety practices are found in Article 110, grounding and bonding in Article 250, and general wiring methods in Article 300. While these topics are part of electrical work, they don't specialize in the fire-alarm systems, so they aren't the article that covers fire alarms.

2. Which design feature of transformer cores helps reduce energy losses due to eddy currents?

- A. Solid Steel
- B. Laminated Steel**
- C. Copper
- D. Air Core

Eddy currents are circulating currents induced in a conductive material when magnetic flux changes. In transformer cores, these currents waste energy as heat. The way to minimize them is to break up the path those currents can take, which is exactly what laminating the core does. By using many thin steel sheets separated by an insulating layer, each sheet carries only small, localized loop currents and the insulating layers prevent currents from flowing through the entire thickness. This dramatically reduces the area of the loops and the overall eddy-current losses. Solid steel would let large loops form and waste more energy; copper isn't used as the core material; an air core would avoid iron losses but isn't practical for providing the needed magnetic path. Laminated steel is the design feature that best reduces eddy-current losses.

3. If kilowatts are known, which expression gives current in a three-phase system?

- A. $I = KW \times 1000 / Volts \times PF \times 1.73$**
- B. $I = KW \times 1000 / (Volts \times PF \times 1.73)$**
- C. $I = KW \times 1000 / Volts \times PF \times 1.73$**
- D. $I = KW \times 1000 / Volts \div (PF \times 1.73)$**

In a three-phase system, real power relates to current by $P = \sqrt{3} \times V_L \times I \times PF$. To find the current when given power in kilowatts, convert P to watts ($P = KW \times 1000$) and solve for current: $I = P / (\sqrt{3} \times V_L \times PF)$. This becomes $I = KW \times 1000 / (Volts \times PF \times 1.73)$, using 1.73 as an approximation for $\sqrt{3}$. The denominator must include Volts, PF, and the $\sqrt{3}$ factor because each plays a role in determining how much current is needed to deliver the real power: voltage provides the driving potential, PF accounts for how much of that power is actually doing useful work, and $\sqrt{3}$ arises from the relationship between line voltage and line current in a three-phase system. For example, with 100 kW, 480 V, and PF of 0.9, $I \approx 1000000 / (480 \times 0.9 \times 1.73) \approx 134$ A.

4. What are the common types of AC motors?

- A. DC motors and servo motors**
- B. Induction motors and synchronous motors**
- C. Universal motors and stepper motors**
- D. Reluctance motors and hysteresis motors**

AC motors are best understood as belonging to two main categories: induction motors and synchronous motors. Induction motors get their torque from a rotating magnetic field produced by the stator; the rotor spins a little slower than the field, so current is induced in the rotor and torque results. They are simple, rugged, inexpensive, and highly effective for a wide range of applications, which is why they make up the bulk of AC motor use. Synchronous motors, on the other hand, run at the exact speed of the rotating magnetic field because the rotor locks in step with it, typically using DC excitation or permanent magnets. This precise speed and good efficiency make them ideal when exact speed or timing is important. Other motor types mentioned are not the standard broad categories of AC motors. DC motors and servo motors are typically powered or used in DC or specially controlled systems. Universal motors and stepper motors are specialized designs that aren't considered the typical broad classes of AC motors. Reluctance and hysteresis motors exist but are more niche and far less common in everyday AC motor applications.

5. What term is defined as electrical potential, electrical pressure?

- A. Voltage**
- B. Current**
- C. Resistance**
- D. Grounding**

Voltage is electrical potential, or electrical pressure—the push that makes charges move through a circuit. It's the potential difference between two points that drives current when a path exists. Measured in volts, voltage determines how strongly the source can push current; the higher the voltage, the greater the driving force for current, as described by Ohm's law ($I = V/R$). The other terms describe what happens to that push: current is the actual flow of charges, resistance is the opposition to that flow, and grounding is a safety path to earth.

6. Which motor requires an inverter to operate?

- A. AC traction motor**
- B. DC traction motor**
- C. Inverter**
- D. Battery system**

AC traction motors need an inverter because they require AC power with a controllable frequency to vary speed and torque. If the system's power source is DC, an inverter converts that DC into AC and adjusts the frequency to control how fast the motor spins. DC traction motors can run directly from a DC supply, so they don't need an inverter for basic operation. A battery system is just the power source, not a type of motor. So the motor that requires an inverter to operate is the AC traction motor.

7. Which motor type generally has lower maintenance due to no brushes?

- A. DC Motors**
- B. Synchronous Motors**
- C. AC Motors**
- D. Induction Motors**

Brush wear drives a lot of motor maintenance. DC motors use carbon brushes and a commutator to switch current as the rotor turns, which causes wear, sparking, and periodic replacement. AC motors, especially induction motors, operate without any contacting brushes—the stator's rotating magnetic field induces currents in the rotor, so there are no brush wear issues to manage. That absence of brushes means fewer parts to wear and less routine maintenance. Some synchronous motor designs can use brushes for rotor excitation or have slip rings, so maintenance needs can vary, but in general AC motors—without brushes—provide the lower-maintenance option.

8. Which tool is used to bend EMT and other conduit?

- A. Wire strippers
- B. Conduit bender**
- C. Multimeters
- D. Fish tape

To shape EMT conduit properly, you need a tool designed specifically for bending metal tubing. A conduit bender is built for this job, featuring a bend shoe and lever that let you form precise angles with the correct bend radius. This prevents kinks or flattened sections and ensures the conduit fits neatly against boxes, fittings, and along walls while meeting spacing and code requirements. The other tools serve different tasks: wire strippers remove insulation from conductors, multimeters measure electrical values, and fish tape helps pull conductors through conduits or walls but does not bend conduit.

9. Frequency units?

- A. Amperes
- B. Volts
- C. Hz**
- D. Ohms

Frequency is the rate at which something repeats per unit time, specifically how many cycles occur each second. The unit for this rate is the hertz, abbreviated Hz, meaning one cycle per second. This is the standard way we describe repeating signals like AC waveforms or radio signals. A familiar example is household AC power, which in many places runs at 60 Hz, so the waveform completes 60 cycles every second. The other options measure different electrical properties: amperes are current, volts are voltage, and ohms are resistance. So Hz is the unit that directly expresses how often a periodic signal repeats per second.

10. What is needed for speed control of AC motors?

- A. A simple resistor network
- B. Frequency converters and variable frequency drives**
- C. Solar panels
- D. Gearbox adjustments

Controlling speed of an AC motor comes from changing the supply frequency (and the accompanying voltage) delivered to the motor. For an induction motor, the speed is tied to the synchronous speed, which depends on the line frequency; you can slow or accelerate the motor by lowering or raising that frequency. A frequency converter or variable frequency drive does this smoothly, adjusting both frequency and voltage as needed to keep motor flux stable and provide controlled acceleration, deceleration, and protection. Other options won't give reliable or efficient speed control: a simple resistor network wastes energy and distorts torque, solar panels aren't a practical source for controlled drive power, and adjusting a gearbox only changes the mechanical output after the motor, not the motor's electrical speed.

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://septaelectrician.examzify.com>

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

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