

PMMI INDUSTRIAL ELECTRICITY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 statement is true for a parallel circuit?**
 - A. The current through each component is the same.
 - B. The total resistance is the sum of all resistors.
 - C. The power output of each component is the same.
 - D. The voltage drop across each component is the same.
- 2. How many 1200-watt hair dryers can be operated by a 120V circuit protected by a 20 amp circuit breaker?**
 - A. 0
 - B. 1
 - C. 2
 - D. 3
- 3. What is the total resistance of the circuit shown?**
 - A. 19Ω
 - B. 27Ω
 - C. 20Ω
 - D. 15Ω
- 4. Which statement best describes a systematic approach to troubleshooting electrical problems?**
 - A. Define the problem, gather data, and implement a fix immediately without testing.
 - B. Gather data, then guess and replace components until it works.
 - C. Verify the fix first, then gather data and define the problem.
 - D. Define the problem, gather data, establish a theory, test the theory, implement a fix, verify, and document.
- 5. What is the purpose of insulation resistance testing (megger), and what indicates good health?**
 - A. To detect insulation deterioration; high insulation resistance indicates good health
 - B. To measure conductor resistance
 - C. To assess mechanical wear
 - D. To estimate operating temperature

- 6. Protection coordination isolates which faults?**
- A. Short-circuit faults and ground faults; open circuits are not faults in this sense
 - B. Open circuits and short circuits
 - C. Ground faults and open circuits
 - D. Transient faults and sustained faults
- 7. Which device stores energy in an electric field and has capacitance measured in Farads?**
- A. Capacitor
 - B. Inductor
 - C. Resistor
 - D. Transformer
- 8. What is the role of a thermal overload in motor protection coordination with a contactor?**
- A. It provides instantaneous overload protection without coordination
 - B. It cools the motor when overheated
 - C. It trips if the motor overheats due to overload, coordinating with the contactor to disconnect power
 - D. It adjusts voltage to limit current
- 9. Which setup is commonly used to check continuity in a circuit?**
- A. A battery and a voltmeter
 - B. An oscilloscope and generator
 - C. A fuse and ammeter
 - D. A battery and a test light
- 10. In an AC circuit, $\cos(\phi)$ equals R divided by Z . If $R = 12\ \Omega$ and $Z = 20\ \Omega$, what is $\cos(\phi)$?**
- A. 0.8
 - B. 1.0
 - C. 0.6
 - D. 0.3

Answers

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

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Explanations

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1. Which statement is true for a parallel circuit?

- A. The current through each component is the same.
- B. The total resistance is the sum of all resistors.
- C. The power output of each component is the same.
- D. The voltage drop across each component is the same.**

In a parallel circuit, the same voltage is across every component. All components are connected between the same two nodes, so the potential difference they experience is identical. That's why the voltage drop across each component is the same. Currents split among the branches depending on each branch's resistance, so the current through each component is not the same. The total resistance in parallel isn't the sum of the resistances; instead, the reciprocals add ($1/R_{\text{total}} = 1/R_1 + 1/R_2 + \dots$), which typically lowers the overall resistance. Power isn't the same for every component either. With the same voltage across different resistors, $P = V^2/R$ shows that different R values draw different power. So the statement that the voltage drop across each component is the same is the true characteristic of a parallel circuit.

2. How many 1200-watt hair dryers can be operated by a 120V circuit protected by a 20 amp circuit breaker?

- A. 0
- B. 1
- C. 2**
- D. 3

The main idea is how current, voltage, and power relate on a circuit. A device that uses 1200 watts at 120 volts draws current $I = P / V = 1200 / 120 = 10$ amperes. A 20-amp circuit breaker can supply up to 20 amperes, so you can run up to two of these dryers at the same time ($2 \times 10 \text{ A} = 20 \text{ A}$). Three would require 30 amperes, which would trip the breaker. In practice, startup surges can affect current, but the straightforward calculation shows two is the limit for this setup.

3. What is the total resistance of the circuit shown?

- A. 19 Ω
- B. 27 Ω
- C. 20 Ω
- D. 15 Ω**

Total resistance is found by simplifying the network using series and parallel rules. In this circuit, resistors are arranged so that a pair is in parallel, and that parallel combination sits in series with another resistor. You first find the parallel equivalent: if the two resistors are 10 Ω and 30 Ω , their parallel result is R_p where $1/R_p = 1/10 + 1/30 = 4/30$, so $R_p = 7.5 \Omega$. Then you add the resistor in series with that parallel group: $7.5 \Omega + 7.5 \Omega = 15 \Omega$. So the total resistance comes out to 15 Ω . The other numbers would come from using different combinations or misidentifying the series/parallel relationships.

4. Which statement best describes a systematic approach to troubleshooting electrical problems?

- A. Define the problem, gather data, and implement a fix immediately without testing.
- B. Gather data, then guess and replace components until it works.
- C. Verify the fix first, then gather data and define the problem.
- D. Define the problem, gather data, establish a theory, test the theory, implement a fix, verify, and document.**

Systematic troubleshooting in electrical problems is a structured, data-driven process that prevents guesswork. It starts by defining the problem clearly and identifying its scope, then gathering data such as symptoms, measurements, and operating conditions. With this information, you establish a theory about the likely cause and design tests to validate or refute that theory. If the tests support the theory, you implement a fix and then verify that the issue is resolved under normal operation and that no new problems were created. Finally, you document the problem, the steps taken, the results, and the final solution for future reference. That sequence is best because it relies on evidence and repeatable checks to confirm the root cause before making changes, ensures the fix actually resolves the issue, and creates a record for future maintenance. Options that skip testing, guess-and-replace components, or verify a solution before clearly defining the problem violate this logical, methodical approach and can lead to unresolved issues or repeated failures.

5. What is the purpose of insulation resistance testing (megger), and what indicates good health?

- A. To detect insulation deterioration; high insulation resistance indicates good health**
- B. To measure conductor resistance
- C. To assess mechanical wear
- D. To estimate operating temperature

Insulation resistance testing with a megohmmeter checks how well the insulation resists leakage by applying a high DC voltage to the insulation and measuring the leakage current to compute resistance. The aim is to reveal insulation deterioration, moisture, or contamination that would lower resistance and threaten reliability. A high resistance value means the insulation is still doing its job effectively, indicating good health; a low value flags problems that may require maintenance or repair. This test specifically targets insulation between conductors and earth or between different conductors, not the resistance of the conductors themselves. It doesn't assess mechanical wear or articulation of moving parts, and it isn't used to estimate operating temperature. For a complete picture, technicians consider insulation resistance alongside proper test voltage, ambient conditions, and sometimes indices like the polarization index to track how resistance changes over time.

6. Protection coordination isolates which faults?

- A. Short-circuit faults and ground faults; open circuits are not faults in this sense
- B. Open circuits and short circuits
- C. Ground faults and open circuits
- D. Transient faults and sustained faults

Protection coordination is about arranging protective devices so that the nearest device to a fault trips, keeping the rest of the system energized. The faults that protective systems are designed to interrupt are those that cause large fault currents—short-circuit faults (conductors at different potentials shorted together) and ground faults (current path to earth). These faults create high currents that protective devices detect and quickly interrupt to protect equipment and personnel. An open circuit, on the other hand, does not produce a fault current; it's simply a broken path with no abnormal current flow. Since there's no overcurrent to clear, open circuits aren't the faults targeted for isolation in protection coordination.

7. Which device stores energy in an electric field and has capacitance measured in Farads?

- A. Capacitor
- B. Inductor
- C. Resistor
- D. Transformer

Capacitors store energy in the electric field between two conductors separated by a dielectric. The key idea is that they hold electrical charge proportional to the voltage across them, and this property is called capacitance, measured in Farads. The energy stored in a capacitor is given by $E = 1/2 C V^2$, so higher capacitance or higher voltage leads to more energy stored. Other devices behave differently: inductors and transformers store energy in magnetic fields and are measured in Henries, while resistors do not store energy at all—they dissipate it as heat.

8. What is the role of a thermal overload in motor protection coordination with a contactor?

- A. It provides instantaneous overload protection without coordination
- B. It cools the motor when overheated
- C. It trips if the motor overheats due to overload, coordinating with the contactor to disconnect power
- D. It adjusts voltage to limit current

Thermal overloads protect motors by sensing overheating caused by excessive current. When the motor draws more than it can safely handle for a period of time, a heat-sensing element inside the overload heats up and causes a mechanical action that trips the device. This trip interrupts the circuit and, in a motor starter, de-energizes the contactor coil so the contactor opens and power to the motor is cut off. The coordination aspect means the overload is designed to work with the contactor so that the timing protects the motor from damage while avoiding unnecessary trips during normal startups or brief overloads. It does not cool the motor and it does not regulate or adjust voltage.

9. Which setup is commonly used to check continuity in a circuit?

- A. A battery and a voltmeter
- B. An oscilloscope and generator
- C. A fuse and ammeter
- D. A battery and a test light**

Continuity is checked by confirming there's a complete path for current to flow. To do this quickly you want a simple on/off indication that appears when current can pass through the circuit. A battery provides the small, known DC source, and a test light serves as the current indicator. When the path is closed, current flows and the light glows; when the path is open, no current flows and the light stays dark. This makes it a fast, easy way to verify that a conductor, switch, wire, or connection is continuous without needing to measure exact voltages or resistances. A battery with a voltmeter wouldn't give a straightforward pass/fail for continuity since the voltmeter only reads voltage and can be inconclusive if there are resistive drops, partial paths, or if components affect the reading. An oscilloscope with a generator is used for analyzing and visualizing signals, not for a simple continuity check. A fuse and ammeter setup is about protecting and measuring current in a circuit branch, not about confirming an uninterrupted path. The test light approach directly shows whether current can flow, which is the essence of continuity.

10. In an AC circuit, $\cos(\phi)$ equals R divided by Z. If $R = 12\ \Omega$ and $Z = 20\ \Omega$, what is $\cos(\phi)$?

- A. 0.8
- B. 1.0
- C. 0.6**
- D. 0.3

In AC circuits, $\cos(\phi)$ represents the ratio of the resistive part to the total impedance, reflecting the angle between voltage and current. This comes from the impedance triangle where Z is the hypotenuse, R is the adjacent side, and X is the reactance, so $\cos(\phi) = R/Z$. Substituting the given values gives $\cos(\phi) = 12/20 = 0.6$. This means the phase angle is $\arccos(0.6) \approx 53$ degrees, indicating there is reactive content in the circuit (not purely resistive). The number 0.6 is the power-factor value for this case.

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:

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

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