

PMMI Industrial Electricity 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

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- 1. Conductor ampacity is determined by**
 - A. The cross-sectional area of the conductor**
 - B. How much load is applied to the conductor**
 - C. The heat generated under load, ambient temperature, and the heat resistance of the insulation**
 - D. The nominal voltage required to cause electron flow**

- 2. Which component stores energy in a magnetic field?**
 - A. Capacitor**
 - B. Resistor**
 - C. Inductor**
 - D. Transformer**

- 3. To calculate voltage drop in a conductor, which quantities are needed?**
 - A. Current, Length of Wire & Cross-sectional area of wire (to calculate Resistance)**
 - B. Power, Length of Wire, Thickness of insulation**
 - C. Power, Thickness of Insulation, Cross-sectional area of the wire**
 - D. None of the above.**

- 4. Capacitance is measured in units called:**
 - A. Volts**
 - B. Farads**
 - C. Ohms**
 - D. Henrys**

- 5. What is the resistance of a circuit that is being supplied by a 100VDC power source that is putting out 5 amps?**
 - A. 500 ohms**
 - B. 20 ohms**
 - C. .05 ohms**
 - D. 25 ohms**

- 6. What is the total power of 4 quarter watt resistors wired in Parallel?**
- A. $\frac{1}{4}$ Watt**
 - B. $\frac{1}{16}$ Watt**
 - C. 1 Watt**
 - D. 4 Watt**
- 7. What is true of a capacitor in a DC circuit?**
- A. The capacitor will discharge until voltage is removed then act as an open.**
 - B. Capacitors cannot be used in DC circuits.**
 - C. The capacitor will charge to the source voltage and then act as a short in the circuit.**
 - D. The capacitor will charge to the source voltage and then act as an open in the circuit.**
- 8. To measure the voltage drop in a circuit, the voltmeter should be connected in the circuit by:**
- A. Disconnecting power, removing the wire leading to the device in question, and wiring the meter in its place.**
 - B. Placing the test leads in parallel with the device in question.**
 - C. Removing all but the device in question and measuring the voltage through it.**
 - D. By placing an ammeter in series with the device.**
- 9. How many overloads are needed for a 3-phase induction motor?**
- A. 1**
 - B. 2**
 - C. 3**
 - D. 4**
- 10. What is the total power used in a circuit that has ten single phase motors wired in parallel? Each motor pulls 2A at 240VAC with a frequency of 60Hz.**
- A. 480 Watts**
 - B. 4800 Watts**
 - C. 120 Watts**
 - D. 48 Watts**

Answers

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

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Explanations

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1. Conductor ampacity is determined by
 - A. The cross-sectional area of the conductor
 - B. How much load is applied to the conductor
 - C. The heat generated under load, ambient temperature, and the heat resistance of the insulation**
 - D. The nominal voltage required to cause electron flow

Ampacity is the maximum current a conductor can carry safely without exceeding its temperature rating under specified conditions. The key factor is heat: current flowing through the conductor generates heat (I^2R losses), and how hot that heat makes the conductor depends on the ambient temperature and how well the insulation can resist and dissipate heat. If the environment is hotter or the insulation is more restrictive, the same current will raise the temperature more, lowering the allowable current. That's why the determining factors are the heat produced under load, the ambient temperature, and the insulation's heat resistance. The cross-sectional area affects resistance and heating but does not by itself set the limit; the load relates to the actual current but ampacity is the rated maximum under the given conditions, and voltage does not determine ampacity.

2. Which component stores energy in a magnetic field?
 - A. Capacitor
 - B. Resistor
 - C. Inductor**
 - D. Transformer

Inductors store energy in a magnetic field. When current flows through a coil, a magnetic field builds up around it and a portion of the energy is stored in that field. The stored energy equals $\frac{1}{2} L I^2$, with L as the inductance and I as the current. This magnetic energy is why inductors resist sudden changes in current, since changing the current alters the magnetic field and the energy in it, creating a back-EMF that opposes the change. A capacitor stores energy in an electric field between its plates ($\frac{1}{2} C V^2$), a resistor mainly dissipates energy as heat, and a transformer uses magnetic fields to transfer energy between windings rather than primarily storing it. So, the component that stores energy in a magnetic field is the inductor.

3. To calculate voltage drop in a conductor, which quantities are needed?
 - A. Current, Length of Wire & Cross-sectional area of wire (to calculate Resistance)**
 - B. Power, Length of Wire, Thickness of insulation
 - C. Power, Thickness of Insulation, Cross-sectional area of the wire
 - D. None of the above.

Voltage drop along a conductor comes from Ohm's law: $V_{\text{drop}} = I \times R$. To find R for a conductor, you use the material's resistivity along with its geometry: $R = \rho L/A$. That means you need the current flowing through the conductor (I), the length of the wire (L), and the cross-sectional area (A). The insulation thickness or the power rating don't determine the resistance and thus don't directly set the voltage drop, though they can influence heating or insulation considerations separately. So the quantities needed are current, length, and cross-sectional area.

4. Capacitance is measured in units called:

- A. Volts
- B. Farads
- C. Ohms
- D. Henrys**

Capacitance is measured in farads. The farad is defined as one coulomb of charge stored per volt of potential difference, which describes how much charge a capacitor can hold for a given voltage. The Henry, by contrast, is the unit for inductance, not capacitance. Volts measure electrical potential, and ohms measure resistance, so they do not describe how much charge a capacitor can store. In practice, capacitance values are often expressed in smaller units such as microfarads, nanofarads, or picofarads.

5. What is the resistance of a circuit that is being supplied by a 100VDC power source that is putting out 5 amps?

- A. 500 ohms
- B. 20 ohms**
- C. .05 ohms
- D. 25 ohms

Ohm's law in action: $V = I \times R$. To find resistance when voltage and current are known, use $R = V / I$. With a 100 V DC supply and 5 A flowing, the resistance is 100 divided by 5, which equals 20 ohms. This means the circuit presents 20 Ω to the power source. If you test other values, you'd see inconsistent results: 500 Ω would only allow about 0.2 A at 100 V; 0.05 Ω would draw about 2000 A; 25 Ω would yield about 4 A.

6. What is the total power of 4 quarter watt resistors wired in Parallel?

- A. $\frac{1}{4}$ Watt
- B. $\frac{1}{16}$ Watt
- C. 1 Watt**
- D. 4 Watt

In parallel, each resistor shares the same voltage and each can dissipate up to its own rated power independently. If you have four resistors, each rated at 0.25 W, the network's total safe dissipation is the sum of all four ratings: $0.25 \text{ W} \times 4 = 1 \text{ W}$. So the four parallel resistors can collectively handle up to 1 watt. The other values would not reflect the combined rating of four identical resistors in parallel (they correspond to the rating of a single resistor or an incorrect sum).

7. What is true of a capacitor in a DC circuit?

- A. The capacitor will discharge until voltage is removed then act as an open.**
- B. Capacitors cannot be used in DC circuits.**
- C. The capacitor will charge to the source voltage and then act as a short in the circuit.**
- D. The capacitor will charge to the source voltage and then act as an open in the circuit.**

In DC circuits, a capacitor starts by letting current flow as it charges, so it initially behaves like a short. As charging continues, the current tapers off and the voltage across the capacitor rises toward the source voltage. When the capacitor voltage has reached the source voltage, there is no steady DC current through the capacitor, so it effectively becomes an open circuit. That's why a capacitor in a DC circuit charges to the source voltage and then acts as an open in the circuit. The other ideas don't fit: it doesn't remain a short after charging, and in a DC circuit it doesn't automatically discharge to zero unless there's a path to discharge or the source is removed. Capacitors can indeed be used in DC circuits for various reasons, such as decoupling and DC blocking.

8. To measure the voltage drop in a circuit, the voltmeter should be connected in the circuit by:

- A. Disconnecting power, removing the wire leading to the device in question, and wiring the meter in its place.**
- B. Placing the test leads in parallel with the device in question.**
- C. Removing all but the device in question and measuring the voltage through it.**
- D. By placing an ammeter in series with the device.**

Voltage is the potential difference between two points, so to measure the voltage drop across a device you need to expose those two points to the meter. Placing the voltmeter's test leads across the device—connecting it in parallel—reads the same voltage difference that exists across the device. The voltmeter is designed with very high input resistance, so it draws only a tiny current and doesn't disturb the circuit. If the meter were placed in series, it would become part of the current path and would alter the circuit, giving an incorrect reading. The other approaches either replace a wire with the meter or measure current with an ammeter, neither of which properly measures the device's voltage.

9. How many overloads are needed for a 3-phase induction motor?

- A. 1
- B. 2
- C. 3**
- D. 4

Three-phase motors need protection that watches each of the three current-carrying lines. A practical and effective approach is a thermal overload relay with three sensing elements—one for each phase. If any phase draws excess current and overheats, the corresponding element causes the relay to trip, cutting all three lines to protect the windings. Because protection is needed for every phase, three overload elements are used.

10. What is the total power used in a circuit that has ten single phase motors wired in parallel? Each motor pulls 2A at 240VAC with a frequency of 60Hz.

- A. 480 Watts
- B. 4800 Watts**
- C. 120 Watts
- D. 48 Watts

When motors run in parallel, they all see the same supply voltage and the total power is the sum of each motor's power. Each motor draws 2 A at 240 V, so the power for one motor is $P = V \times I = 240 \times 2 = 480 \text{ W}$. With ten motors, the total power is $10 \times 480 \text{ W} = 4800 \text{ W}$. The frequency (60 Hz) doesn't change this calculation here. So the circuit uses 4800 watts.

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://pmmiindustrialelectricity.examzify.com>

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

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