

NATIONAL ELECTRICAL CODE (NEC) ARTICLE 690 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 section of the NEC specifically relates to grounding for PV systems?**
 - A. Article 250
 - B. Article 690
 - C. Article 300
 - D. Article 100
- 2. Flexible cords connected to which component of tracking PV systems must comply with Article 400?**
 - A. Battery banks
 - B. Monitoring equipment
 - C. Moving parts
 - D. Inverter connections
- 3. Which of the following types of isolating devices is permitted for PV system equipment?**
 - A. An isolating switch that is easily operated
 - B. A toggle switch
 - C. A mating connector meeting specific requirements
 - D. A manual push button
- 4. According to Article 690, what should be rated when selecting conductors?**
 - A. Only the ampacity is important
 - B. Protection against thermal overloads
 - C. The maximum system voltage or higher
 - D. Maximum current capacity only
- 5. Where are wiring methods with PV system DC circuits greater than 1,000V not permitted?**
 - A. On porches
 - B. On or in single-family dwellings
 - C. On rooftops
 - D. In exterior conduits

- 6. Which section addresses the requirements for latches on enclosures for PV systems?**
- A. Section 690.15
 - B. Section 690.25
 - C. Section 690.35
 - D. Section 690.40
- 7. According to Article 690, what should be the overall focus of a PV system installation?**
- A. Efficiency and cost reduction
 - B. Safety and reliable performance
 - C. Compliance with local codes only
 - D. Use of the latest technology
- 8. For PV systems that are not solidly grounded, what is permitted to be the only connection to ground for the system?**
- A. The grounding electrode conductor
 - B. The equipment grounding conductor
 - C. The system's neutral conductor
 - D. The DC disconnect switch
- 9. In the context of PV systems, what is the defined distance from the array for the term array boundary?**
- A. 2 feet
 - B. 3 feet
 - C. 1 foot
 - D. 5 feet
- 10. What is a key requirement for effective grounding in PV systems under NEC standards?**
- A. Grounding must be permanent and immovable
 - B. Grounding conductors should be the same size as the system wires
 - C. Grounding systems must be tested annually
 - D. Grounding conductors must connect to the grounding electrode system

Answers

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

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Explanations

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1. Which section of the NEC specifically relates to grounding for PV systems?

- A. Article 250
- B. Article 690**
- C. Article 300
- D. Article 100

The section of the National Electrical Code (NEC) that specifically addresses grounding for photovoltaic (PV) systems is Article 690. This article focuses on solar energy systems and provides detailed requirements regarding installation, wiring, and safety measures, including grounding practices to ensure safe operation and protection of both the equipment and personnel working with or near the systems. Grounding is a critical aspect of PV system installation as it helps to prevent electrical shock hazards and ensures that any fault currents are safely directed to the ground. Article 690 specifies how grounding should be implemented, including the types of grounding conductors, equipment bonding, and the requirements for grounding electrical equipment used in solar energy systems. While other articles in the NEC, such as Article 250, also discuss grounding and bonding, they provide more general information applicable to all types of electrical systems rather than the specific requirements for PV systems. Article 300 outlines general installation techniques for conductors and cables, and Article 100 defines terms used throughout the NEC. Therefore, Article 690 is the correct reference for grounding requirements specific to photovoltaic systems.

2. Flexible cords connected to which component of tracking PV systems must comply with Article 400?

- A. Battery banks
- B. Monitoring equipment
- C. Moving parts**
- D. Inverter connections

Flexible cords used in tracking photovoltaic (PV) systems must comply with Article 400 because this article outlines the requirements for flexible cords and cables. In the context of PV systems, the moving parts of a tracker require flexible cords to facilitate movement while ensuring safe electrical connections. Flexible cords are specifically intended for applications where cables must flex or move regularly, making compliance with the standards set forth in Article 400 essential to maintain the integrity and safety of these connections. In other contexts, for instance, battery banks and inverter connections, while important, don't specifically emphasize the need for flexibility as crucial as that required for moving parts. Similarly, monitoring equipment may not have the same movement requirement as components directly related to the motion of the tracking system. Therefore, flexible cords connected to moving parts must adhere to Article 400 to ensure they can withstand the mechanical stresses and environmental conditions encountered during operation.

3. Which of the following types of isolating devices is permitted for PV system equipment?

- A. An isolating switch that is easily operated
- B. A toggle switch
- C. A mating connector meeting specific requirements**
- D. A manual push button

The correct choice highlights the use of a mating connector that meets specific requirements for isolating devices in photovoltaic (PV) systems. Mating connectors are specifically designed to disconnect and isolate electrical equipment safely, ensuring that maintenance can be performed without risking electrical shock or damage to the system. These connectors must comply with relevant standards that guarantee their reliability and safety for the application in a PV system, making them an appropriate choice for isolating devices. The other options are not as suitable for PV systems due to various reasons. An isolating switch that is easily operated is indeed useful, but its design and construction must meet certain standards to ensure it can handle the electrical load and provide safe isolation, which may not always be the case. Toggle switches, while common in many applications, are not typically designed for the harsher electrical conditions and safety requirements found in PV systems. Similarly, a manual push button does not provide a reliable means of isolation for high-voltage systems, as they are generally not intended for that purpose in the context of electrical safety and performance in PV installations.

4. According to Article 690, what should be rated when selecting conductors?

- A. Only the ampacity is important
- B. Protection against thermal overloads
- C. The maximum system voltage or higher**
- D. Maximum current capacity only

When selecting conductors in accordance with Article 690, it is essential to consider the maximum system voltage or higher. This is because conductors must be able to handle the electrical demands of the system they are part of without risk of insulation breakdown or failure. The NEC emphasizes that conductors should have appropriate voltage ratings that match or exceed the voltage levels they will experience in operation. Considering the maximum system voltage ensures that the conductor's insulation will not be compromised during normal operation or under fault conditions, thus maintaining safety and performance within a photovoltaic system. By selecting conductors rated for the maximum system voltage, you help prevent potential hazards like electrical arcing, fire, or damage to connected equipment. Other considerations like ampacity and protection against overloads are also important in conductor selection, but they revolve primarily around ensuring safety and operational efficiency rather than focusing solely on voltage ratings. Therefore, understanding and applying the correct voltage rating is critical to compliance with the NEC and effective system performance.

5. Where are wiring methods with PV system DC circuits greater than 1,000V not permitted?

- A. On porches
- B. On or in single-family dwellings**
- C. On rooftops
- D. In exterior conduits

Wiring methods with photovoltaic (PV) system direct current (DC) circuits greater than 1,000 volts are specifically not permitted on or in single-family dwellings due to safety concerns associated with high voltage systems. The National Electrical Code (NEC) prioritizes residential safety, and when dealing with such high DC voltages, there is a significant risk of electric shock or fire hazards if proper precautions and methods are not followed. By prohibiting these wiring methods in single-family dwellings, the NEC seeks to mitigate these dangers for occupants and first responders. In contrast, while the other locations mentioned may have their own considerations, they do not face the same level of risk associated with the residential environment. Porches, rooftops, and exterior conduits may be allowed under specific circumstances, provided that appropriate safeguards are in place for installation and maintenance. Thus, focusing on single-family dwellings aligns with the NEC's emphasis on protecting individuals and property from the hazards associated with high-voltage DC circuits.

6. Which section addresses the requirements for latches on enclosures for PV systems?

- A. Section 690.15
- B. Section 690.25
- C. Section 690.35**
- D. Section 690.40

The correct choice is based on the specific coverage of enclosure requirements found within the NEC. Section 690.35 specifically addresses the requirements for latches on enclosures for photovoltaic (PV) systems. This section outlines the criteria necessary to ensure that enclosures are securely closed and that any latches used are appropriately designed to provide safety and protect against unauthorized access, issues that are crucial in the context of electrical installations. Understanding the need for secure enclosures in PV systems is vital due to the potential electrical hazards and the need to protect the equipment from environmental factors or tampering. By focusing on these requirements, Section 690.35 helps to contribute to the overall safety and integrity of solar energy systems. In comparison, although other sections may address related topics like installation and performance requirements, they do not specifically focus on the latch requirements applicable to enclosures, which is why they are not the correct choice for this question.

7. According to Article 690, what should be the overall focus of a PV system installation?

- A. Efficiency and cost reduction
- B. Safety and reliable performance**
- C. Compliance with local codes only
- D. Use of the latest technology

The overall focus of a photovoltaic (PV) system installation, as outlined in Article 690 of the National Electrical Code (NEC), is centered on safety and reliable performance. This is crucial because the installation of PV systems involves high voltages and currents that can pose serious hazards if not properly managed. Ensuring safety involves adhering to specific guidelines and standards that protect not only the installers but also the end-users and the public. Reliable performance is equally important, as it ensures that the PV system operates effectively over its intended lifespan. This encompasses not just the initial installation but also ongoing maintenance and the ability to withstand environmental factors. By focusing on safety and reliability, installers help guarantee that the system functions correctly and minimizes risks such as electrical fires, shock hazards, and system failures. While efficiency, cost reduction, and the use of the latest technology may be worthwhile considerations in the installation process, they should not overshadow the paramount objective of ensuring safe and dependable operation of PV systems. Compliance with local codes is also significant, but it is primarily a aspect of maintaining safety and reliability, rather than an end goal in itself.

8. For PV systems that are not solidly grounded, what is permitted to be the only connection to ground for the system?

- A. The grounding electrode conductor
- B. The equipment grounding conductor**
- C. The system's neutral conductor
- D. The DC disconnect switch

In photovoltaic (PV) systems that are not solidly grounded, the equipment grounding conductor serves as the appropriate connection to ground for the system. This is crucial because the equipment grounding conductor is specifically designed to ensure that metal enclosures and exposed conductive parts are effectively grounded, thereby providing a safe path for fault currents and preventing electric shock hazards. The equipment grounding conductor is essential in ungrounded or impedance-grounded systems, where it helps maintain safety without introducing significant ground fault current. By ensuring that the equipment grounding conductor is the only connection to ground in such systems, the risks associated with ground faults and equipment failures are minimized while making sure that personnel working on or near the PV systems remain safe. In contrast, other connections to ground listed in the options, such as the grounding electrode conductor or the system's neutral conductor, do not fulfill the same safety purposes in the context of an ungrounded system. The grounding electrode conductor is typically used to connect the grounding system to the grounding electrodes and is not meant to carry fault currents, while the neutral conductor is involved in carrying operational current and is generally grounded in solidly grounded systems to provide a reference point. The DC disconnect switch, while crucial for the operation of PV systems, does not provide a direct ground

9. In the context of PV systems, what is the defined distance from the array for the term array boundary?

- A. 2 feet
- B. 3 feet
- C. 1 foot**
- D. 5 feet

The term "array boundary" in the context of photovoltaic (PV) systems specifically refers to the defined clearance area surrounding the solar array. This boundary is established to ensure safety, operations, and maintenance of the solar installation. The correct distance for the array boundary is set at 1 foot as per the National Electrical Code (NEC). This clearance is crucial for allowing access to the array for service and maintenance while also providing a safety buffer to mitigate risks associated with electrical hazards. Maintaining this specified distance helps ensure that individuals working near the array can do so safely without coming too close to electrical components that may present shock or arcing hazards. While the other distances might be applicable in other contexts or codes, the NEC specifically defines the array boundary as 1 foot to align with safety and operational recommendations for PV installations. This ensures that there is a standardized approach to the spacing requirements for PV systems, thereby promoting safer practices across the industry.

10. What is a key requirement for effective grounding in PV systems under NEC standards?

- A. Grounding must be permanent and immovable
- B. Grounding conductors should be the same size as the system wires
- C. Grounding systems must be tested annually
- D. Grounding conductors must connect to the grounding electrode system**

In photovoltaic (PV) systems, a key requirement for effective grounding is that grounding conductors must connect to the grounding electrode system. This connection is essential for ensuring that any fault current is safely dissipated into the earth, which helps protect both the equipment and personnel from electrical faults and lightning strikes. The grounding electrode system is a critical component of the electrical installation, as it serves as a reference point for the electrical system and provides a path to ground for any surge currents. By connecting the grounding conductors to the grounding electrode system, the installation complies with NEC guidelines that ensure the safety and performance of the PV system. Effective grounding helps to minimize the risk of electrocution, enhances the stability of the electrical system, and reduces the likelihood of equipment damage during electrical faults. This underscores the importance of adhering to the NEC standards regarding proper grounding practices in PV systems.

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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