POWER QUALITY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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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!

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Questions

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1. In NFPA 70B, which scenario permits working on or near energized conductors despite not de-energizing?

A. When a supervisor approves after PPE check

B. When it is not feasible to de-energize or when de-energizing would create a greater hazard

C. When the voltage is below threshold

D. When the equipment is new

2. Which event is a short-lived, high magnitude voltage deviation?

A. Spike

B. Sag

C. Swell

D. Interruption

3. IEEE 519 provides recommended practices and limits for what aspect of electrical power systems?

A. Voltage regulation only.

B. Harmonic control, harmonic currents/voltage limits and total distortion.

C. Lightning protection.

D. Ground fault protection.

4. Which device is used to control motor speed by altering frequency and voltage?

A. Variable Frequency Drive

B. Uninterruptible Power Supply

C. Circuit Breaker

D. Transformer

5. How does higher line impedance affect fault current magnitudes and the ability to mitigate power quality issues?

A. It reduces fault current magnitudes and can limit effectiveness of protective devices and PQ mitigation strategies.

B. It increases fault current magnitudes and makes mitigation easier.

C. It has no impact on fault currents or mitigation.

D. It always improves PQ without any downside.

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6. According to NFPA 70B, as a general rule, no electrical apparatus should be worked on while it is ?

A. Energized

B. Grounded

C. Isolated

D. De-energized

7. What is a Dynamic Voltage Restorer (DVR) and how does it function?

A. It monitors only frequency.

B. It stores energy in batteries.

C. A DVR injects a controlled voltage in series with the line to regulate the point-of-connection voltage during sags/swells, improving local PQ.

D. It uses a transformer to step-down.

8. A DVR is connected how in the power system?

A. In series with the load

B. In parallel across the source

C. At the neutral conductor

D. On the DC side of the rectifier

9. NIOSH identified five scenarios that describe the incidents resulting in fatalities. Improperly installed or damaged equipment accounted for what percent of the accidents?

A. 23%

B. 5%

C. 17%

D. 12%

10. Which statement about interharmonics is correct?

A. Interharmonics are integer multiples of the fundamental frequency.

B. Interharmonics are non-integer multiples of the fundamental frequency.

C. Interharmonics always occur with DC offset.

D. Interharmonics have no effect on power quality.

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Answers

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

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Explanations

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1. In NFPA 70B, which scenario permits working on or near energized conductors despite not de-energizing?

A. When a supervisor approves after PPE check

B. When it is not feasible to de-energize or when de-energizing would create a greater hazard

C. When the voltage is below threshold

D. When the equipment is new

Working on or near energized conductors is allowed only as an exception when de-energizing isn't feasible or would create a greater hazard. NFPA 70B recognizes that de-energizing is the safest default, but if shutting off power would disrupt essential operations or lead to a bigger danger, energized work may proceed under a documented plan with proper controls, and by a qualified person wearing the right PPE and using suitable safeguards. This scenario fits because it states the situation where de-energizing isn't feasible or would create a greater hazard, which is exactly the approved condition for performing work on or near energized conductors. The other options don't establish the necessary justification: approvals based only on PPE checks, voltage level as a sole criterion, or the equipment being new do not by themselves authorize live work.

2. Which event is a short-lived, high magnitude voltage deviation?

A. Spike

B. Sag

C. Swell

D. Interruption

In power quality, a voltage spike is a brief, high-amplitude deviation from normal voltage. It happens very quickly—lasting only a few microseconds to milliseconds—and reaches a much higher value than the nominal voltage. This short but sharp surge is what characterizes a spike, often caused by switching actions, lightning, or sudden inrush currents. This differs from a sag, which is a temporary drop in voltage; a swell, which is a temporary overvoltage that tends to last longer than a spike; and an interruption, which is a complete loss of voltage. So the event described—short-lived and high magnitude—fits a voltage spike best.

3. IEEE 519 provides recommended practices and limits for what aspect of electrical power systems?

A. Voltage regulation only.

B. Harmonic control, harmonic currents/voltage limits and total distortion.

C. Lightning protection.

D. Ground fault protection.

Harmonic distortion control is what IEEE 519 focuses on. Nonlinear loads—like variable-speed drives, switching power supplies, and other electronics—draw current in sharp pulses, causing waveform distortion that can heat equipment, cause overheating, interference, and misoperation in sensitive appliances. IEEE 519 provides recommended practices and explicit limits on both harmonic currents and voltages, and on the overall total harmonic distortion (THD) that may be present in a power system. It also guides how to manage these harmonics through filtering, proper system design, and accommodation at the point of common coupling, so the distorted signals stay within safe, predictable levels for the entire network. This is distinct from topics like voltage regulation, which is about maintaining steady voltage levels, or lightning and ground fault protection, which deal with transient events and safety protections rather than harmonic content.

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4. Which device is used to control motor speed by altering frequency and voltage?

A. Variable Frequency Drive

B. Uninterruptible Power Supply

C. Circuit Breaker

D. Transformer

Controlling motor speed by altering frequency and voltage relies on how induction motors respond to supply frequency. The motor's speed is tied to the frequency of the applied power, and to vary speed you adjust both frequency and voltage so the magnetic flux stays constant. A variable frequency drive does exactly this: it converts incoming AC to DC and then back to AC at a controllable frequency and voltage, typically using pulse-width modulation. By increasing or decreasing the output frequency, you change the motor's RPM, and by scaling the voltage to maintain a steady V/Hz ratio, torque remains predictable and starting is smooth. This coordinated control of frequency and voltage is what makes a VFD the device used to control motor speed. The other devices don't provide this kind of speed control. An uninterruptible power supply mainly supplies backup power and conditioning; a circuit breaker protects against faults; a transformer changes voltage levels but does not modify frequency in normal operation, so it cannot regulate motor speed through frequency and voltage adjustments.

5. How does higher line impedance affect fault current magnitudes and the ability to mitigate power quality issues?

A. It reduces fault current magnitudes and can limit effectiveness of protective devices and PQ mitigation strategies.

B. It increases fault current magnitudes and makes mitigation easier.

C. It has no impact on fault currents or mitigation.

D. It always improves PQ without any downside.

Higher line impedance reduces the short circuit current because the fault current is determined by the total impedance seen from the source to the fault. As impedance increases, I_fault = V / (Z_source + Z_line + Z_fault) drops. This weaker fault current can make protection devices less effective: breakers and fuses rely on reaching certain current thresholds to operate promptly, and lower fault currents can delay or prevent automatic clearance or correct coordination. For power-quality mitigation, many remedies depend on having enough current to interact with the network—such as injecting compensating currents or engaging dynamic support—and a weaker system can limit how well these measures work. In addition, higher impedance tends to cause larger voltage drops during disturbances, which can worsen voltage-related PQ issues like sags and flicker. Overall, a weaker (higher-impedance) line both reduces fault current and can impede the effectiveness of protective and mitigation strategies.

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6. According to NFPA 70B, as a general rule, no electrical apparatus should be worked on while it is ?

A. Energized

B. Grounded

C. Isolated

D. De-energized

The main idea here is safety during electrical maintenance: you should not work on electrical equipment while it is live. NFPA 70B emphasizes de-energizing the equipment and applying lockout/tagout before performing maintenance to eliminate the energy source and reduce the risk of electric shock, arc flash, or burns. Even if the equipment is grounded or isolated, there can still be stored or residual energy that could release unexpectedly, so those conditions do not make it safe to work. De-energized is the safe state for most work, and only under controlled, specialized energized-work procedures with strict controls would someone work on live equipment.

7. What is a Dynamic Voltage Restorer (DVR) and how does it function?

A. It monitors only frequency.

B. It stores energy in batteries.

C. A DVR injects a controlled voltage in series with the line to regulate the point-of-connection voltage during sags/swells, improving local PQ.

D. It uses a transformer to step-down.

A Dynamic Voltage Restorer restores voltage at the load by actively injecting a compensating voltage in series with the supply. When the line experiences a sag or swell, the DVR senses the deviation from the desired voltage, then its power electronics generate a voltage with the appropriate magnitude and phase and inject it in series with the line. This keeps the point of connection voltage at the load within acceptable limits, improving local power quality. The injected voltage is supplied from energy stored in the DVR's DC link (often capacitors or batteries), but the essential function is the series voltage insertion that corrects the disturbance. This is different from devices that merely monitor frequency, store energy without corrective action, or use a transformer to step voltage down.

8. A DVR is connected how in the power system?

A. In series with the load

B. In parallel across the source

C. At the neutral conductor

D. On the DC side of the rectifier

A DVR regulates the load voltage by injecting a controlled AC voltage in series with the load. This placement lets the device add or subtract a precise amount of voltage directly into the line feeding the load, keeping the voltage seen by the load within the desired range during sags, swells, or disturbances. If it were connected across the source (in parallel), it would act as another voltage source fighting the main supply and could cause circulating currents instead of properly regulating the load voltage. It isn't placed at the neutral or on the DC side of a rectifier, because a DVR treats the AC line and aims to influence the AC voltage seen by the load. Therefore, the correct connection is in series with the load.

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9. NIOSH identified five scenarios that describe the incidents resulting in fatalities. Improperly installed or damaged equipment accounted for what percent of the accidents?

A. 23%

B. 5%

C. 17%

D. 12%

Understanding how fatal incidents are distributed across NIOSH's scenario categories is being tested here, specifically the share assigned to improperly installed or damaged equipment. This scenario accounts for 17% of the accidents, meaning roughly one in six fatalities fall under equipment that wasn't installed correctly or became damaged in a way that led to a fatal outcome. This highlights the importance of proper installation, secure assembly, and timely maintenance or replacement of equipment to prevent life-threatening failures. The other percentage options reflect shares of other distinct scenarios identified by NIOSH, so they don't describe this particular category.

10. Which statement about interharmonics is correct?

A. Interharmonics are integer multiples of the fundamental frequency.

B. Interharmonics are non-integer multiples of the fundamental frequency.

C. Interharmonics always occur with DC offset.

D. Interharmonics have no effect on power quality.

Interharmonics are spectral components whose frequencies are not integer multiples of the fundamental grid frequency. On a 50 or 60 Hz system, harmonics occur at integer multiples like 2f, 3f, 4f, and so on, but interharmonics appear between those lines, for example around 66 Hz or 98 Hz on a 60 Hz system. They arise from sources such as power-electronic converters and variable-speed drives that modulate output frequency, producing energy at non-integer multiples of the base frequency. This is why the correct statement identifies interharmonics as non-integer multiples. They do not inherently come with a DC offset, and they can impact power quality by causing fluctuations, measurement errors, and potential stresses on equipment. The other descriptions don't fit because they imply integer multiples, a mandatory DC offset, or no effect on power quality.

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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.

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

https://powerquality.examzify.com

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

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