NLC ELECTRICAL GRID 2 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.

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

1. In a Delta electrical system, the voltage is described as which type?

A. Phase to phase

B. Phase to neutral

C. Line to line

D. Neutral to phase

2. In a series circuit, is the current through each component the same or different?

A. Current through each component is different

B. Current through each component is the same

C. Current increases with added components

D. Current becomes zero

3. Load shedding is defined as what?

A. Automatic shedding of all loads.

B. Deliberate disconnection of critical loads only.

C. Deliberate disconnection of non-critical loads to prevent system collapse.

D. Increasing generation to cover deficit.

4. In protection coordination, what does selectivity mean?

A. Only the faulted zone trips.

B. All zones trips on fault.

C. No zone trips.

D. Protection acts randomly.

5. Which statement correctly describes the main difference between series and parallel circuits?

A. In a series circuit, current is the same through all components; in a parallel circuit, voltage is the same across all branches.

B. In a series circuit, both voltage and current are the same across all components.

C. In a parallel circuit, current is the same through all branches; voltage varies.

D. Only series circuits allow current flow; parallel circuits do not.

6. When load shedding is implemented, who typically executes it automatically?

A. Manually by operators.

B. Automatically by EMS in stages.

C. Only during fault conditions.

D. At a pre-set time of day.

7. Phase sequence verification is performed to ensure what?

A. Phase sequence verification ensures correct rotation direction.

B. It causes motor stalls.

C. It is unrelated to rotation.

D. It increases power consumption.

8. In power-flow studies, define PQ, PV, and Slack buses and indicate which variables are known or unknown at each bus type.

A. PQ bus: P and Q specified; V and δ unknown. PV bus: P and V specified; Q and δ unknown. Slack bus: V and δ specified; P and Q adjust.

B. PQ bus: P and Q specified; V and δ unknown. PV bus: P and V specified; Q and δ unknown. Slack bus: V and δ specified; P and Q adjust to balance.

C. PQ bus: V specified; P unknown; Slack bus: P and Q specified.

D. PQ bus: P and Q specified; V known; Slack bus: V and δ unknown.

9. What is state estimation in power systems and what data are typically used?

A. State estimation uses a simple average of all measurements to estimate voltages.

B. State estimation uses a Weighted Least Squares optimization to estimate bus voltages and angles from heterogeneous measurements, including SCADA and PMUs, and to detect bad data.

C. State estimation only uses SCADA data and ignores PMUs.

D. State estimation predicts future loads without any measurements.

10. Which formula expresses electrical power in a DC circuit?

A. Power = volts × amps

B. Power = volts ÷ amps

C. Power = amps × ohms

D. Power = watts ÷ volts

Answers

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

Explanations

1. In a Delta electrical system, the voltage is described as which type?

A. Phase to phase

B. Phase to neutral

C. Line to line

D. Neutral to phase

In a delta arrangement, each winding is connected directly between two lines, so the voltage across a winding—its phase voltage—is the voltage between those two lines. That is why the voltage is described as phase-to-phase (line-to-line). There's typically no neutral conductor in a delta, so phase-to-neutral descriptions don't apply here. If you were looking at a wye connection, you'd have line-to-neutral voltages and, between lines, a line-to-line voltage that's √3 times the phase-to-neutral value.

2. In a series circuit, is the current through each component the same or different?

A. Current through each component is different

B. Current through each component is the same

C. Current increases with added components

D. Current becomes zero

In a series circuit, there is only one path for the current to take, so the same amount of charge flows through every component in that loop. The current is the rate of flow of electrons, and with a single path, what goes through one element must go through the next and the next in the same amount per second. That's why the current through each component is the same. The overall current is set by the supply voltage and the total resistance in the loop: I = V / R_total. When you add more components in series, the total resistance increases, which lowers the current in the loop, but the current that does flow passes through each component identically. If the circuit is ever opened, no current flows anywhere. So the reason the current is the same through all components in a series circuit is that there's only one path for the charge to flow and charge conservation ensures a single consistent current throughout that path.

3. Load shedding is defined as what?

A. Automatic shedding of all loads.

B. Deliberate disconnection of critical loads only.

C. Deliberate disconnection of non-critical loads to prevent system collapse.

D. Increasing generation to cover deficit.

Load shedding is the deliberate disconnection of non-critical loads to prevent system collapse when the available generation cannot meet demand or during a disturbance. By shedding non-essential demand, the grid preserves stability and keeps critical services—like hospitals and emergency systems—operational. The aim is to maintain system frequency and voltage within safe limits, minimizing the impact on society while avoiding a wider blackout. Increasing generation to cover the deficit is not load shedding; it's trying to meet demand without shutting off loads.

4. In protection coordination, what does selectivity mean?

A. Only the faulted zone trips.

B. All zones trips on fault.

C. No zone trips.

D. Protection acts randomly.

Selectivity in protection coordination means the protective device closest to the fault operates to clear it, while devices farther upstream remain energized. This keeps only the faulted section isolated, preserving as much of the system as possible. In practice, relays are set with coordinated timing so the downstream zone trips first, and upstream protection backups only if the fault isn't cleared or a downstream device fails. So, only the faulted zone trips. Options proposing all zones trip, no trip, or random action would cause unnecessary outages or fail to clear the fault, which is not how coordinated protection is designed to work.

5. Which statement correctly describes the main difference between series and parallel circuits?

A. In a series circuit, current is the same through all components; in a parallel circuit, voltage is the same across all branches.

B. In a series circuit, both voltage and current are the same across all components.

C. In a parallel circuit, current is the same through all branches; voltage varies.

D. Only series circuits allow current flow; parallel circuits do not.

The main idea is how current and voltage behave differently in one path versus multiple paths. In a series circuit there is only a single path for current, so the same current flows through every component; the total supply voltage is split among the components and the voltages add up to the source. In a parallel circuit there are multiple paths, so the voltage across each branch is the same as the source, while the currents in each branch can differ and add up to the total current. This matches the statement: the current is the same through all components in a series circuit, and the voltage is the same across all branches in a parallel circuit. The other descriptions run counter to how current and voltage distribute in series and parallel networks.

6. When load shedding is implemented, who typically executes it automatically?

A. Manually by operators.

B. Automatically by EMS in stages.

C. Only during fault conditions.

D. At a pre-set time of day.

Load shedding in practice is an automatic, staged response driven by the Energy Management System. The EMS constantly monitors important grid indicators like frequency, voltage, and line loading. When these indicators show stress beyond predefined limits, the EMS kicks off a sequence of shedding steps, cutting non essential loads in a controlled order and in stages. This automated approach is faster and more coordinated than manual actions, helping to steady the system and prevent a larger outage while generation and transmission adjust. The staging also allows operators to observe the impact and make fine-tuned decisions if needed. It's a condition based action, not tied to a fixed time of day or limited only to fault conditions.

7. Phase sequence verification is performed to ensure what?

A. Phase sequence verification ensures correct rotation direction.

B. It causes motor stalls.

C. It is unrelated to rotation.

D. It increases power consumption.

Phase sequence verification checks the order of the three supply phases to ensure the rotating magnetic field moves in the intended direction. In a three-phase motor, the sequence of voltages determines which way the magnetic field rotates; a wrong sequence makes the motor run in the opposite direction or behave unpredictably. Verifying the sequence confirms that the motor will start and run with the correct rotation and torque. It doesn't inherently cause stalls, is not unrelated to rotation, and doesn't aim to increase power use.

8. In power-flow studies, define PQ, PV, and Slack buses and indicate which variables are known or unknown at each bus type.

A. PQ bus: P and Q specified; V and δ unknown. PV bus: P and V specified; Q and δ unknown. Slack bus: V and δ specified; P and Q adjust.

B. PQ bus: P and Q specified; V and δ unknown. PV bus: P and V specified; Q and δ unknown. Slack bus: V and δ specified; P and Q adjust to balance.

C. PQ bus: V specified; P unknown; Slack bus: P and Q specified.

D. PQ bus: P and Q specified; V known; Slack bus: V and δ unknown.

The essential idea is which quantities are held fixed at each bus and which are solved for in a power-flow calculation. At a PQ bus, both active and reactive power are specified, so the voltage magnitude and the voltage angle at that bus are the unknowns the solver determines. At a PV bus, the active power and the voltage magnitude are specified, so the reactive power and the voltage angle are unknowns to be found by the solution. At the Slack (reference) bus, the voltage magnitude and the voltage angle are fixed, and the solver adjusts the active and reactive power at that bus to balance the overall power in the network. This matches the given answer because it correctly states which quantities are known or unknown for each bus type. The other options mix up which variables are fixed, especially for the Slack bus and PV bus, making them inconsistent with the standard definitions used in power-flow studies.

9. What is state estimation in power systems and what data are typically used?

A. State estimation uses a simple average of all measurements to estimate voltages.

B. State estimation uses a Weighted Least Squares optimization to estimate bus voltages and angles from heterogeneous measurements, including SCADA and PMUs, and to detect bad data.

C. State estimation only uses SCADA data and ignores PMUs.

D. State estimation predicts future loads without any measurements.

State estimation is the process of determining the voltages and their phase angles at all buses in the power system from measurements, rather than by direct measurement of every state. The standard method uses a Weighted Least Squares optimization to find the state vector (bus voltages and angles) that best fits all available measurements, and it performs bad-data detection through the residuals of the fit. Measurements come from two main sources: SCADA, which provides broad coverage data like power flows, injections, and voltage magnitudes; and PMUs, which deliver time-synchronized phasors—both magnitude and angle—for voltages and currents at high speed. Because these measurements have different accuracies and update rates, the estimator weights them accordingly, giving more influence to the more reliable data. The relationships between measurements and the state are nonlinear, so the problem is solved iteratively (often with Gauss-Newton) to converge on the most plausible state. The result is an estimated set of bus voltages and angles plus residuals used to flag bad data and ensure observability. Averaging measurements would miss the physics and constraints, using only SCADA neglects valuable angle information from PMUs, and predicting loads without measurements isn't estimating the current state at all.

10. Which formula expresses electrical power in a DC circuit?

A. Power = volts × amps

B. Power = volts ÷ amps

C. Power = amps × ohms

D. Power = watts ÷ volts

Power in a DC circuit comes from multiplying the voltage across a component by the current through it, giving power in watts. So the expression volts × amps matches $P = V \times I$, which is the direct formula for electrical power. The other options don't compute power: dividing voltage by current would give resistance ($V/I = R$); multiplying current by ohms would yield volts ($I \times R = V$); and watts divided by volts would give current ($P/V = I$) rather than a direct power formula.

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://nlcegrid2.examzify.com

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