LADWP ELECTRIC STATION OPERATOR – CIRCUIT BREAKERS, DISCONNECTS, TRANSFORMERS 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. Which action best describes restoring service after a fault by using alternate paths?

A. Re-routing current to unfaulted circuits

B. Increasing load on the faulted path

C. Ventilating the switchgear

D. Ignoring the fault

2. When outages occur, operators re-route current flow to circuits that are not _____.

A. Faulted

B. Unfaulted

C. Operating

D. Overloaded

3. During surface faults, porcelain fragmentation is observed on the surface of a _____ or insulator.

A. Bushing

B. Conductor

C. Transformer

D. Panel

4. Larger transformers are about _____% efficient.

A. 95

B. 97

C. 98

D. 99

5. A simple power transformer essentially consists of two _____.

A. Windings

B. Coils

C. Inductors

D. Rectifiers

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6. In a transformer with no moving parts, the losses arise from field excitation and the resistance of what component?

A. Windings insulation

B. Core material

C. Cooling system

D. External load

7. Which gas is listed among dielectric media used in circuit breakers for interrupting power system currents?

A. Oxygen

B. Nitrogen

C. Sulfur Hexafluoride gas

D. Argon

8. Name two common transformer cooling methods and where they are used.

A. OANR and ONAF used in dry-type transformers.

B. ONAF (Oil Natural Air Forced) and ONAN (Oil Natural Air Natural) used in oil-filled transformers.

C. OAF (Oil Air Forced) and ONA (Oil Natural Air) used in gas-filled transformers.

D. ONAN stands for Oil Natural Air Natural; ONAF stands for Oil Natural Air Forced.

9. The ability of a substance to prevent the flow of electrical current is described as its _____ strength.

A. Dielectric strength

B. Conductivity

C. Resistance

D. Permittivity

10. When current flow in a coil causes an emf to be induced in itself, it is known as _____.

A. Self induction

B. Mutual induction

C. Inductance

D. Flux

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Answers

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

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Explanations

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1. Which action best describes restoring service after a fault by using alternate paths?

A. Re-routing current to unfaulted circuits

B. Increasing load on the faulted path

C. Ventilating the switchgear

D. Ignoring the fault

Restoring service after a fault by using alternate paths is about reconfiguring the network so loads are fed from unfaulted circuits. When a fault occurs, protective devices isolate the damaged section, and operators or automatic schemes switch power to healthy routes—feeding the same customers through different feeders or a different bus. This keeps the system energized and minimizes outage time while the fault is cleared or the faulty equipment is repaired. Pushing more load onto the faulted path would drive current through the problem area, risking further damage or a bigger outage. Ventilating the switchgear is a safety/pressure-relief action during a fault, not a method to restore service. Ignoring the fault leaves the system without power and unnecessary risk.

2. When outages occur, operators re-route current flow to circuits that are not _____.

A. Faulted

B. Unfaulted

C. Operating

D. Overloaded

When outages occur, the goal is to keep power flowing by using alternate paths that are free of faults. Circuits that are unfaulted are healthy paths with no active fault, so routing current to them helps restore service quickly while isolating the fault to its location. This reduces the risk of further tripping or causing additional problems on the network. Choosing a circuit that is faulted would defeat the purpose, since faulted paths can trip protections or fail to carry the load, and routing to a circuit that is overloaded or merely operating doesn't guarantee a safe, stable path. So the emphasis is on directing current toward unfaulted, healthy circuits to maintain service during an outage.

3. During surface faults, porcelain fragmentation is observed on the surface of a _____ or insulator.

A. Bushing

B. Conductor

C. Transformer

D. Panel

During a surface fault, the current travels along the surface of the insulation rather than through the air, causing arcing and mechanical stress that chips and fragments the porcelain. A bushing is a porcelain-insulated component through which a conductor passes, so its outer porcelain surface is where fragmentation is most readily observed. While conductors, transformers, and panels may be involved in faults, the visible porcelain fragmentation described here is characteristic of the insulating surface—specifically a bushing or insulator.

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4. Larger transformers are about _____% efficient.

A. 95

B. 97

C. 98

D. 99

Large transformers run very efficiently because their design minimizes the main loss sources while delivering near full rated power. At full load, the losses are mainly core losses (iron losses) which stay fairly constant and are a small fraction of the rated power, and copper losses (I^2R) which are kept as low as possible with large, low-resistance windings and good cooling. When you add these losses together, they typically amount to about 2% of the output, which puts the efficiency around 98%. Some units can approach 99% under ideal conditions, but 98% is the common practical figure used for large transformers. Lower efficiencies (in the mid-to-upper 90s) are more typical of smaller or older designs where losses aren't as well minimized.

5. A simple power transformer essentially consists of two _____.

A. Windings

B. Coils

C. Inductors

D. Rectifiers

Two windings wound on a common magnetic core form the basic structure of a simple power transformer. The primary winding receives alternating current, which produces a changing magnetic flux in the core. This flux links to the secondary winding and induces a voltage in it, with the voltage ratio set by the turns ratio between the windings. The energy transfer happens through magnetic coupling between these two windings, so there's no direct electrical connection between input and output. While windings (or coils) describe the conducting turns, the defining feature here is having two windings on a shared core. Inductors typically have a single winding and store energy in the magnetic field, not transfer it to a separate circuit, and rectifiers convert AC to DC and are not the transformer itself.

6. In a transformer with no moving parts, the losses arise from field excitation and the resistance of what component?

A. Windings insulation

B. Core material

C. Cooling system

D. External load

When a transformer has no moving parts, the main losses come from the magnetic core as it is excited by the primary field. The changing magnetic flux in the core leads to energy loss through hysteresis in the core material and through eddy currents inside the conductive core. These core losses are intrinsic to the core material and scale with the level of field excitation and flux density, which is why the resistance associated with the core material is the source of these losses. Copper losses in the windings are a separate effect due to winding resistance, while the cooling system and insulation don't themselves dissipate significant energy; they merely carry away heat produced by those losses. External load affects the power delivered to the load, not the intrinsic loss mechanisms inside the transformer core.

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7. Which gas is listed among dielectric media used in circuit breakers for interrupting power system currents?

A. Oxygen

B. Nitrogen

C. Sulfur Hexafluoride gas

D. Argon

Sulfur hexafluoride is used because it combines very high dielectric strength with strong arc-quenching ability. In a circuit breaker, this means the gas can withstand high voltages in the gap between contacts and, when an arc forms during interruption, SF6 absorbs energy from the arc and cools it, helping to extinguish the arc quickly. This allows breakers to interrupt large currents reliably in compact, gas-insulated designs. Oxygen would react and potentially support combustion, so it isn't suitable as a dielectric for interrupting high-power currents. Nitrogen and argon are inert, but their dielectric strength and arc-quenching performance are not as effective as SF6, especially for large currents, so they aren't the preferred media in most interrupting applications. That combination of high insulation capability and efficient arc quenching is why sulfur hexafluoride is the gas listed for this use. (Note: SF6 has environmental and handling considerations in practice.)

8. Name two common transformer cooling methods and where they are used.

A. OANR and ONAF used in dry-type transformers.

B. ONAF (Oil Natural Air Forced) and ONAN (Oil Natural Air Natural) used in oil-filled transformers.

C. OAF (Oil Air Forced) and ONA (Oil Natural Air) used in gas-filled transformers.

D. ONAN stands for Oil Natural Air Natural; ONAF stands for Oil Natural Air Forced.

Two common cooling methods for oil-filled transformers are ONAN and ONAF. ONAN stands for Oil Natural Air Natural, meaning heat is removed by natural circulation of oil and natural air flow around the radiators—no fans or pumps. ONAF stands for Oil Natural Air Forced, where the oil still relies on natural circulation, but the air around the radiators is drawn or pushed by fans to increase heat transfer. The word "Oil" in each abbreviation signals that these methods apply to oil-filled transformers, as opposed to dry-type or gas-filled units. This option is best because it directly provides the two method names and their full forms, which identifies both the cooling approach and the environments they are used in. The other choices use nonstandard acronyms or mix up configurations and are not the typical two methods used for oil-filled transformers.

9. The ability of a substance to prevent the flow of electrical current is described as its _____ strength.

A. Dielectric strength

B. Conductivity

C. Resistance

D. Permittivity

Dielectric strength is the measure of a material's ability to withstand electric stress without breaking down and starting to conduct current. It directly describes how much voltage per thickness the material can tolerate before insulation fails, so a higher dielectric strength means better protection against unwanted current flow under high voltages. Conductivity describes how easily charges move, which is the opposite idea of preventing flow. Resistance tells you how much a material resists current for a given geometry and voltage, but it doesn't specify the voltage at which breakdown occurs. Permittivity relates to how a material polarizes and stores energy in an electric field, affecting capacitance rather than its breakdown or insulation performance.

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10. When current flow in a coil causes an emf to be induced in itself, it is known as _____.

A. Self induction

B. Mutual induction

C. Inductance

D. Flux

Self-induction is when a current flowing in a coil changes and that changing current alters the magnetic flux through the coil, inducing an emf in the same coil. This happens because a changing magnetic flux links with the coil, and Faraday's law says emf = -dΦ/dt. In a practical view, the emf is proportional to how quickly the current changes, described by emf = -L di/dt, where L is the coil's inductance. The negative sign, per Lenz's law, means the induced emf opposes the change in current. This is different from mutual induction, where a changing current in one coil induces emf in a different coil. Inductance is the property of the coil that relates current to its magnetic flux linkage, and flux is the magnetic flux itself.

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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://ladwpcircuitbreakersdisconnectstransformers.examzify.com

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

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