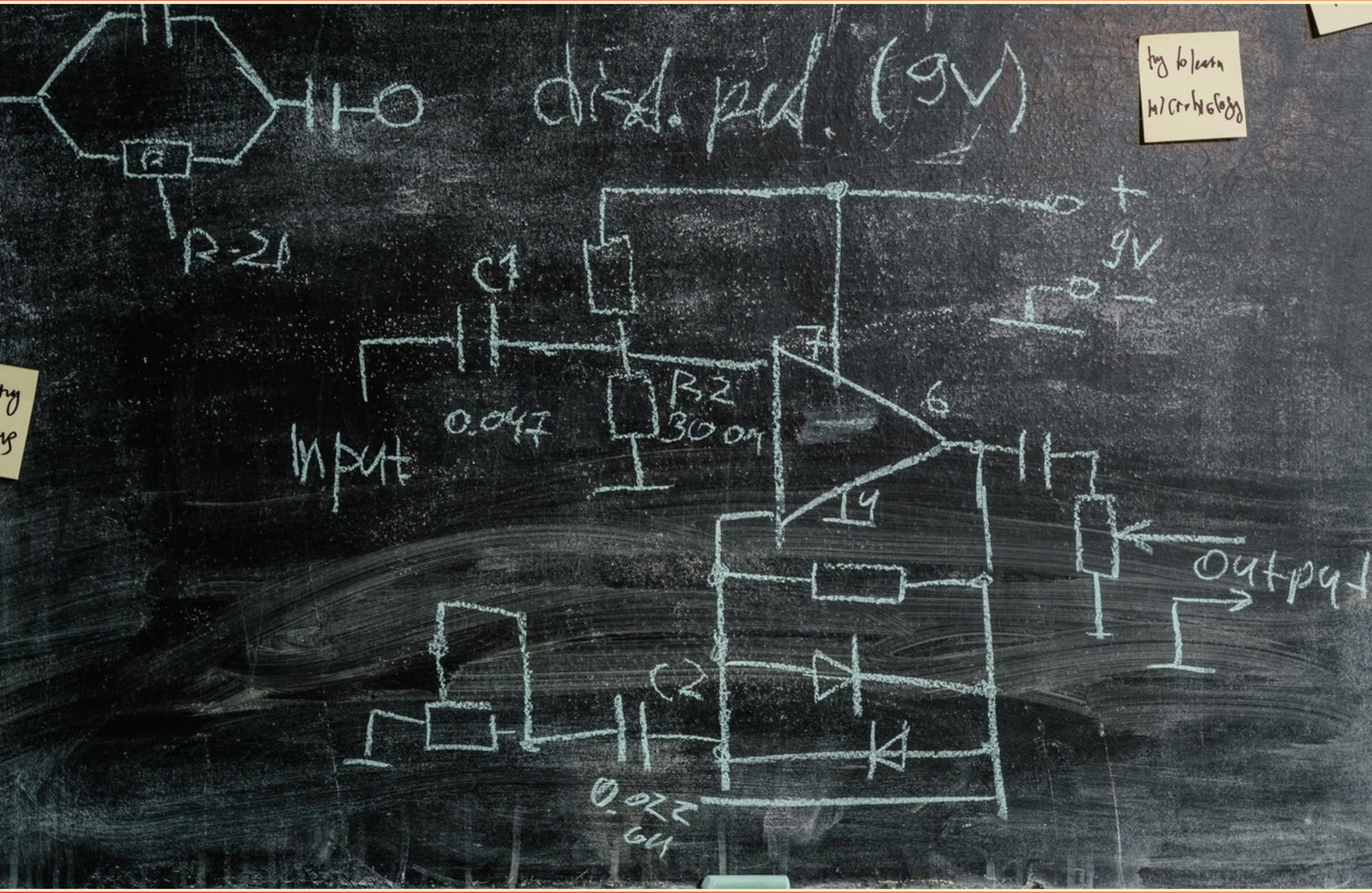
DC THEORY LMS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://dctheorylms.examzify.com

Table of Contents

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. **Lamps will have ratings for both ? and ?.**
    A. Current / Resistance
    B. Voltage / Power
    C. Resistance / Voltage
    D. Voltage / Current

2. **In mesh analysis, how do you handle a current source that lies on a shared edge between two meshes?**
    A. Use a supermesh around the current source; write KVL for the supermesh; relate the mesh currents via the current source value
    B. Remove the current source and replace with its Norton equivalent
    C. Solve the two meshes independently and then enforce the current source relation
    D. The current source cancels out and can be ignored

3. **In a circuit with fixed voltage, increasing a lamp's resistance will cause its wattage to**
    A. Increase
    B. Decrease
    C. Remain the Same
    D. Oscillate

4. **In a series circuit, which two quantities are directly proportional?**
    A. The current across the load and the value of the resistance of that load
    B. The current across the load and the voltage across the load
    C. The current and the wattage across that load
    D. The voltage across the load and the value of the resistance of that load

5. **Electromotive force is measured in which unit?**
    A. Volts
    B. Amps
    C. Ohms
    D. Watts

6. Which formula expresses power as $P = I^2 \times R$?

A. $P = I^2 \times R$

B. $P = V \times I$

C. $P = V^2 / R$

D. $P = R / I$

7. Ferromagnetic materials are materials that ? .

A. Create opposition to the passage of flux lines

B. Are easily magnetized

C. Create the magnetic force between two poles

D. Focus lines of flux

8. Which is the Norton equivalent of a 10 V source in series with a 5 Ω resistor?

A. $I_N = 2$ A; $R_N = 5\ \Omega$

B. $I_N = 1$ A; $R_N = 5\ \Omega$

C. $I_N = 2$ A; $R_N = 10\ \Omega$

D. $I_N = 0$ A; $R_N = 5\ \Omega$

9. In a Thevenin equivalent with a load R_L in series, which expressions correctly give the current and the load voltage?

A. $I = V_{th} * R_L / (R_{th} + R_L)$; $V_L = I * R_{th}$

B. $I = V_{th} / (R_{th} + R_L)$; $V_L = I * R_L$

C. $I = V_{th} / R_{th}$; $V_L = V_{th} - I*R_{th}$

D. $I = V_{th} / (R_{th} - R_L)$; $V_L = I * R_L$

10. A circuit has a dependent voltage source equal to 0.5 times the voltage across a 4 Ω resistor in another branch. How would you incorporate this in nodal analysis?

A. Include a constraint $V_{source} = 0.5 * V_{4\Omega}$ and use a supernode if needed

B. Replace dependent source with a fixed equivalent voltage

C. Treat the dependent source as an independent source

D. Ignore the dependent source in nodal equations

Answers

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

Explanations

1. Lamps will have ratings for both ? and ?.

A. Current / Resistance

B. Voltage / Power

C. Resistance / Voltage

D. Voltage / Current

The key idea is that lamps are specified by the voltage they require and the power they consume. The voltage rating tells you the supply level the lamp is designed to run at, ensuring safe and reliable operation. The power (wattage) rating indicates how much energy the lamp uses at that voltage, which also relates to brightness and heat. Current and resistance aren't fixed ratings you typically rely on for a lamp: current is determined by power and voltage (current = power/voltage), and resistance changes with temperature as the filament heats up. So, knowing the voltage and power lets you understand both how it should be powered and how bright it will be, making them the standard ratings.

2. In mesh analysis, how do you handle a current source that lies on a shared edge between two meshes?

A. Use a supermesh around the current source; write KVL for the supermesh; relate the mesh currents via the current source value

B. Remove the current source and replace with its Norton equivalent

C. Solve the two meshes independently and then enforce the current source relation

D. The current source cancels out and can be ignored

When a current source sits on the border between two meshes, you can't write independent KVL equations for those meshes because the current through the shared edge is fixed by the source. The standard approach is to form a supermesh that goes around both meshes, skipping the current source, and write a single KVL around the outer boundary of that combined loop. Then introduce a constraint that ties the two mesh currents to the current source: the current through the shared edge equals the source value, so the difference between the two mesh currents equals that current, with the sign determined by the direction of the source. Solve the KVL for the supermesh alongside the current-relationship constraint to find the mesh currents. This is why forming a supermesh and using the current-source relation is the correct method. Replacing the current source with a Norton equivalent, solving the meshes independently, or ignoring the current source would not satisfy the fixed current constraint on the shared edge.

3. In a circuit with fixed voltage, increasing a lamp's resistance will cause its wattage to

A. Increase

B. Decrease

C. Remain the Same

D. Oscillate

With a fixed supply voltage, the lamp's wattage is determined by P = V^2 / R. If you increase the lamp's resistance, the current it draws drops (I = V / R). Since power equals voltage times current, a smaller current means less power is dissipated. So the wattage decreases. It won't stay the same or oscillate under a steady DC supply.

4. In a series circuit, which two quantities are directly proportional?

A. The current across the load and the value of the resistance of that load

B. The current across the load and the voltage across the load

C. The current and the wattage across that load

D. The voltage across the load and the value of the resistance of that load

In a series circuit, the same current flows through every component. That current is I for the load, and Ohm's law tells us the voltage across the load is V_load = I × R_load. Since the current is the same for that load, the voltage drop across it changes directly with the load's resistance. If the resistance goes up, the voltage drop goes up in direct proportion; if the resistance goes down, the voltage drop goes down in direct proportion. So the voltage across the load and the resistance of that load are directly proportional. The other options don't have this straightforward proportionality in a series circuit. The current through a load isn't directly proportional to its own resistance because the overall circuit current depends on the total resistance and the source. While V = I R relates voltage, current, and resistance, the current varies with the circuit, so the pair that tracks changes together most directly is voltage across the load and its resistance. Wattage depends on both current and resistance (P = I^2 R), so it doesn't line up with a simple direct proportionality to either quantity alone.

5. Electromotive force is measured in which unit?

A. Volts

B. Amps

C. Ohms

D. Watts

Emf is the energy per unit charge that a source provides to push charges around a circuit. The unit used for this potential difference is the volt, with 1 volt equaling 1 joule per coulomb (V = J/C). This tells you how strongly a source can drive current: a higher emf means more energy per charge available to move charges through the circuit. The other quantities describe different things: amperes measure how much charge flows per second (current), ohms measure resistance, and watts measure power. So the unit for electromotive force is volts.

6. Which formula expresses power as P = I^2 × R?

A. P = I^2 × R

B. P = V × I

C. P = V^2 / R

D. P = R / I

Power in a resistor is the rate at which electrical energy is converted to heat, which is given by P = VI. For a resistor, the voltage across it and the current through it are related by Ohm's law V = IR. Substituting this into P = VI gives P = I × (IR) = I^2 R. This shows why power is proportional to the square of the current and to the resistance: if you double the current through the same resistor, the power turned into heat quadruples, and if you raise the resistance while keeping the current the same, more power is dissipated as heat as well. This form is particularly handy when you know the current and the resistance but not the voltage. The expression P = VI is the general power rule, and with Ohm's law you can derive the other equivalent forms, such as P = V^2 / R, since V = IR implies V^2 / R = (IR)^2 / R = I^2 R. The option P = R / I wouldn't yield the correct units for power, so it isn't valid.

7. Ferromagnetic materials are materials that ? .

A. Create opposition to the passage of flux lines

B. Are easily magnetized

C. Create the magnetic force between two poles

D. Focus lines of flux

Ferromagnetic materials respond strongly to magnetic fields because their magnetic domains align readily when a field is applied. This domain alignment produces a large net magnetization, so these materials have very high magnetic permeability and low reluctance to the flux. That's why they're described as easily magnetized and are chosen for cores in transformers and inductors—they guide and concentrate flux efficiently. The other statements don't define ferromagnetism: opposing flux lines describes diamagnetism, not ferromagnetism; the magnetic force between two poles isn't a property the material itself creates; and while high permeability can help focus flux, the essential point is the easy magnetization due to domain alignment.

8. Which is the Norton equivalent of a 10 V source in series with a 5 Ω resistor?

A. I_N = 2 A; R_N = 5 Ω

B. I_N = 1 A; R_N = 5 Ω

C. I_N = 2 A; R_N = 10 Ω

D. I_N = 0 A; R_N = 5 Ω

In Norton form, a voltage source in series with a resistor becomes a current source in parallel with the same resistor. The parallel resistance equals the original series resistor, so R_N = 5 Ω. The Norton current is the short-circuit current at the output, which is V_th / R_th = 10 V / 5 Ω = 2 A. Therefore, the Norton equivalent is a 2 A current source in parallel with 5 Ω. This matches the described Norton values I_N = 2 A and R_N = 5 Ω.

9. In a Thevenin equivalent with a load R_L in series, which expressions correctly give the current and the load voltage?

A. I = V_th * R_L / (R_th + R_L); V_L = I * R_th

B. I = V_th / (R_th + R_L); V_L = I * R_L

C. I = V_th / R_th; V_L = V_th - I*R_th

D. I = V_th / (R_th - R_L); V_L = I * R_L

In a Thevenin circuit with the load in series, the current is determined by the total resistance in the loop. The current flowing through both the Thevenin resistance and the load must satisfy Ohm's law for the entire path: I = V_th / (R_th + R_L). The voltage across the load is the current times the load resistance, so V_L = I × R_L. Substituting the expression for I gives V_L = V_th × R_L / (R_th + R_L). This choice is the best because it uses the correct total resistance in the current expression and places the voltage across the load, as the current through a series circuit flows through both elements and the load voltage is the portion of the source voltage that drops across R_L. The other forms mix up where the voltage and current appear, omit the load, or use an incorrect sign in the denominator, leading to inconsistent or unreal results.

10. **A circuit has a dependent voltage source equal to 0.5 times the voltage across a 4 Ω resistor in another branch. How would you incorporate this in nodal analysis?**

A. Include a constraint V_source = 0.5 * V_4Ω and use a supernode if needed

B. Replace dependent source with a fixed equivalent voltage

C. Treat the dependent source as an independent source

D. Ignore the dependent source in nodal equations

When a voltage source connects two non-reference nodes, you handle it by forming a supernode and adding a constraint that relates the two node voltages through the voltage source. Here the dependent source has a value 0.5 times the voltage across a 4 Ω resistor in another branch, so you keep that relationship as a equation linking the two node voltages on either side of the dependent source. Define the two nodes on either side of the dependent voltage source as V1 and V2, with the chosen polarity of the source giving V1 − V2 equal to 0.5 times the voltage across the 4 Ω resistor (let's call that V4Ω, defined with its own polarity). This becomes the constraint: V1 − V2 = 0.5 · V4Ω. If the resistors or other elements connect to either node, you write KCL for the supernode that encloses V1 and V2, summing currents through all elements connected to either node while omitting the current through the voltage source itself. You also relate V4Ω to the node voltages of the resistor's terminals (V4Ω is the difference between those two node voltages). Solving the resulting equations yields the node voltages and, from them, any currents of interest. The other options fail because a dependent voltage source is not a fixed voltage, so you don't replace it with a fixed equivalent, and it isn't an independent source. Ignoring it would omit a crucial constraint that governs the circuit behavior.

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://dctheorylms.examzify.com

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