

NCCER ELECTRICAL LEVEL 2 – CONTROL SYSTEMS AND FUNDAMENTAL CONCEPTS (MODULE 26211-23) 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

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1. How do a short circuit and an overload differ in a circuit?

- A. A short circuit causes an overload without changing resistance; an overload creates near-zero resistance.
- B. A short circuit causes a near-zero resistance path with excessive current; an overload draws more current than the circuit rating under normal resistance.
- C. A short circuit reduces voltage; an overload increases voltage.
- D. A short circuit and an overload are the same condition.

2. What constitutes a functional test for a motor control circuit after wiring changes?

- A. Apply power, verify safe conditions, test start/stop sequence, check holding contact, test overload trip, and observe expected motor operation.
- B. Apply power and observe the motor's sound only.
- C. Visually inspect the wiring without energizing.
- D. Test only the overload trip with no power.

3. Which statement describes the difference between two-wire and three-wire control circuits?

- A. Two-wire control uses line power for the control circuit; three-wire control uses an independent control power source (often via a transformer).
- B. Two-wire control uses three-phase supply; three-wire control uses single-phase.
- C. Two-wire uses four conductors; three-wire uses six conductors.
- D. Two-wire and three-wire control have identical power schemes; the terms are interchangeable.

4. In a parallel circuit, how is voltage and current distributed?

- A. The current through each branch is equal, and the branch voltages sum to the source voltage.
- B. The voltage across all branches varies; branch currents are fixed.
- C. The voltage across each branch is the same; currents in branches add to equal the source current.
- D. The total current is the same as the source current, regardless of branches.

- 5. Which statement is true about normally open contacts?**
- A. They are closed when the coil is energized
 - B. They are closed when the coil is de-energized
 - C. They are always closed
 - D. They are open when the coil is de-energized
- 6. The claim that a contactor action is mechanically held because it depends on current through the coil is true or false?**
- A. Sometimes true
 - B. False
 - C. Not relevant
 - D. True
- 7. Which statement describes one or more advantages of low voltage remote control relay systems?**
- A. All of the above
 - B. Increased wiring complexity
 - C. Higher safety risk
 - D. Slower response times
- 8. What is the purpose of PLC input/output modules?**
- A. Input modules generate control outputs to actuators.
 - B. Input modules sense signals from field devices; Output modules send signals to actuators.
 - C. Input modules store the PLC program.
 - D. Output modules monitor field conditions.
- 9. Which statement best describes how lighting contactors differ from standard contactors?**
- A. Lighting contactors are designed for lighting loads and have different ratings from standard contactors.
 - B. They are identical in all respects.
 - C. Lighting contactors are designed only for motor loads.
 - D. Lighting contactors have higher voltage ratings but same current ratings as standard contactors.

10. What is the function of a limit switch in control circuits?

- A. Mechanical switch activated by machine movement to provide position feedback.
- B. Detects ambient temperature.
- C. Measures pressure.
- D. Stores control data.

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Answers

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

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Explanations

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1. How do a short circuit and an overload differ in a circuit?

- A. A short circuit causes an overload without changing resistance; an overload creates near-zero resistance.
- B. A short circuit causes a near-zero resistance path with excessive current; an overload draws more current than the circuit rating under normal resistance.**
- C. A short circuit reduces voltage; an overload increases voltage.
- D. A short circuit and an overload are the same condition.

Key idea: understand how resistance and current behave in a circuit. A short circuit creates a path of very low resistance, so the current surges high because the source voltage pushes as much current as the near-zero resistance allows. This sudden, excessive current is what triggers protective devices and can cause damage or overheating. An overload happens when the circuit carries more current than its rating but the resistance remains as designed for the load; the current is simply higher than intended, leading to heating over time rather than an immediate surge. So the best description is that a short circuit creates a near-zero resistance path with excessive current, while an overload draws more current than the circuit rating under normal resistance. The other statements misstate how resistance or voltage behaves in these conditions.

2. What constitutes a functional test for a motor control circuit after wiring changes?

- A. Apply power, verify safe conditions, test start/stop sequence, check holding contact, test overload trip, and observe expected motor operation.**
- B. Apply power and observe the motor's sound only.
- C. Visually inspect the wiring without energizing.
- D. Test only the overload trip with no power.

After wiring changes, you test to confirm that the whole control loop works together, not just individual parts. The idea is to verify that power is applied safely and the motor actually responds in the intended way through the full control sequence. First, you ensure safe conditions before energizing anything. That means guards in place, no exposed wiring or contact with moving parts, and the system in a safe state so the test won't pose a hazard. Next, you run through the normal start/stop sequence. When you press the start control, the motor should energize and run, and the control relay or contactor should pull in and stay energized after the start control is released (the holding contact should maintain the run state). When you press stop, or remove the start command, the motor should stop. This verifies the logic of the control circuit and the interlocks or holding circuits. Then you check the protective element: the overload or any protection device should respond properly if there's an overload, trimming the current or cutting power to protect the motor. This confirms the protective devices are wired correctly and functioning. Finally, observe the motor operating as expected under normal conditions—proper direction, speed, and response to the control actions. This confirms the wiring changes didn't introduce miswiring or unintended interactions in the control circuit. Why the other approaches aren't sufficient: simply energizing the system and listening to the motor's sound may miss miswiring or control failures that don't affect sound. A visual inspection without energizing can't confirm electrical operation or safety. Testing only the overload with no power checks nothing about the control sequence or motor response. The comprehensive functional test covers power, safety, start/stop logic, holding operation, protective devices, and actual motor behavior.

3. Which statement describes the difference between two-wire and three-wire control circuits?

- A. Two-wire control uses line power for the control circuit; three-wire control uses an independent control power source (often via a transformer).**
- B. Two-wire control uses three-phase supply; three-wire control uses single-phase.
- C. Two-wire uses four conductors; three-wire uses six conductors.
- D. Two-wire and three-wire control have identical power schemes; the terms are interchangeable.

The main idea is where the control circuit's power comes from. Two-wire control uses line power for the control circuit—the same supply that feeds the load drives the control coil or switch, so the control and load share the same source. Three-wire control uses an independent control power source, typically provided by a transformer, to energize the control circuit, so the control devices operate on a separate supply from the main line voltage. This separation makes control wiring more flexible and isolates the control circuitry from the main power. The other options don't fit because they either misstate the power sources (phase, conductor count) or claim the power schemes are identical.

4. In a parallel circuit, how is voltage and current distributed?

- A. The current through each branch is equal, and the branch voltages sum to the source voltage.
- B. The voltage across all branches varies; branch currents are fixed.
- C. The voltage across each branch is the same; currents in branches add to equal the source current.**
- D. The total current is the same as the source current, regardless of branches.

In a parallel circuit, the voltage across each path is the same as the source voltage. That's because each branch is directly connected across the supply. The current in each branch, however, depends on that branch's resistance (or impedance) and can be different from branch to branch, since $I = V/R$ for each branch. The total current drawn from the source is the sum of all the branch currents, so $I_{\text{total}} = I_1 + I_2 + \dots + I_n$. This is why the statement that the voltage across each branch is the same and the currents in the branches add to equal the source current best describes how voltage and current distribute in parallel circuits. For example, with two branches, each sees the same voltage, but if one branch has a lower resistance it carries more current, and the two currents add together to make the total from the source.

5. Which statement is true about normally open contacts?

- A. They are closed when the coil is energized
- B. They are closed when the coil is de-energized
- C. They are always closed
- D. They are open when the coil is de-energized**

Normally open contacts have no conductivity when the control coil is not energized; energizing the coil creates a magnetic pull that closes the contact, allowing current to flow. So they are open in the de-energized state. In other words, their resting state is open, and energizing the coil closes the contact to complete the circuit.

6. The claim that a contactor action is mechanically held because it depends on current through the coil is true or false?

- A. Sometimes true
- B. False**
- C. Not relevant
- D. True

Energizing the coil creates a magnetic field that pulls the armature to close the contacts, but the armature is released by springs when the current is removed. In a standard contactor, the contact state is not mechanically held by the coil once current stops; it relies on the coil current to stay energized, and the springs return the armature to the de-energized position. A latching design would be different, using a permanent magnet or a mechanical latch to hold state without continuous current. So the claim is false for a typical contactor.

7. Which statement describes one or more advantages of low voltage remote control relay systems?

- A. All of the above**
- B. Increased wiring complexity
- C. Higher safety risk
- D. Slower response times

The main idea is that low voltage remote control relay systems offer several benefits that work together to improve safety, control, and installation practicality. Using a low control voltage means the wiring that operators interact with is safer and carries less risk of shock. The relay provides isolation between the control circuit and the high-power load, so issues on the load side don't directly affect the control side. Remote control lets you operate equipment from a safe, centralized location and can simplify field wiring by using standard low-voltage control circuits to energize relays that switch high-power loads. With proper design, these systems can respond quickly and predictably, enabling coordinated and reliable operation. When you consider these combined advantages—safety, isolation, centralized control, and practical wiring—the option that reflects all of these benefits is the best choice.

8. What is the purpose of PLC input/output modules?

- A. Input modules generate control outputs to actuators.
- B. Input modules sense signals from field devices; Output modules send signals to actuators.**
- C. Input modules store the PLC program.
- D. Output modules monitor field conditions.

The main idea is how a PLC connects with the real world. Input/output modules act as the bridge between the PLC and field devices. Input modules sense signals from field devices such as switches and sensors and convert or condition those signals so the PLC can read them. Output modules take the PLC's decisions and convert them into signals that drive actuators like relays, contactors, motors, or valves. This separation allows the PLC to process data safely and reliably, handling both digital (on/off) and analog (voltage or current) signals as needed. Remember that the program lives in the PLC's memory, while outputs are for commanding field devices and inputs are for reading field conditions.

9. Which statement best describes how lighting contactors differ from standard contactors?

- A. Lighting contactors are designed for lighting loads and have different ratings from standard contactors.
- B. They are identical in all respects.
- C. Lighting contactors are designed only for motor loads.
- D. Lighting contactors have higher voltage ratings but same current ratings as standard contactors.

Lighting contactors are built to switch lighting circuits, which have different electrical characteristics than many other loads, especially motors. Because of these differences, their ratings—current capacity, coil voltage, and contact design—are tailored to lighting applications and inrush behavior, not to motor loads. That's why they aren't simply identical to standard contactors; they are designed for lighting loads and have different ratings to suit those loads. The other statements don't fit because lighting contactors aren't just the same as standard ones, they aren't restricted to motor loads, and their ratings aren't universally higher in voltage while keeping the same current rating. The key idea is the load-specific ratings and construction for lighting applications.

10. What is the function of a limit switch in control circuits?

- A. Mechanical switch activated by machine movement to provide position feedback.
- B. Detects ambient temperature.
- C. Measures pressure.
- D. Stores control data.

Limit switches provide position feedback by using a mechanical actuator that is moved by the machine. When a moving part reaches a defined limit or end of travel, the actuator triggers the switch and changes the electrical state, sending a signal to the control circuit. This lets the controller know where the part is in its travel and to stop, start the next step, or engage a safety interlock as needed. This type of device is specifically about detecting position through mechanical movement, not measuring environmental variables or storing data. A temperature-detecting device would sense ambient temperature, a pressure sensor would measure pressure, and a data-storing device would save information.

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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