

CR104B VEHICLE ELECTRICAL AND MECHANICAL SYSTEMS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE**

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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. Which of the following is NOT a reason to disconnect power before measuring resistance?**
 - A. To Prevent Damage To The Meter
 - B. To Avoid Electrical Shock
 - C. To Obtain An Accurate Measurement
 - D. To Ensure The Circuit Remains Energized

- 2. In a circuit with an open switch, which statement is true?**
 - A. No voltage will exist anywhere in the circuit when the switch is open.
 - B. The entire circuit still has the supply voltage when the switch is open.
 - C. Only the supply side remains energised when the switch is open.
 - D. There can be voltage present in at least part of the circuit when the switch is open.

- 3. An example of a rheostat is:**
 - A. Ignition switch
 - B. Relay
 - C. Instrument panel dimmer switch
 - D. Brake light switch

- 4. A blower motor fuse blows after replacing the motor. The problem could be:**
 - A. lower resistance in the new motor than the original part
 - B. defective fuse
 - C. wiring harness damaged
 - D. switch stuck

- 5. Open circuit voltage at about 25% state of charge is approximately which value?**
 - A. 12.06 volts
 - B. 12.50 volts
 - C. 11.80 volts
 - D. 13.00 volts

- 6. Which statements about door lock actuation are correct?**
- A. A only
 - B. B only
 - C. Both A and B
 - D. Neither
- 7. Which technology do rain sensors use to detect moisture?**
- A. Infrared beams
 - B. Ultrasonic waves
 - C. Capacitance changes
 - D. Mechanical contacts
- 8. When the engine is off and the alternator is not operating, the typical battery terminal voltage is about which range?**
- A. 14.0-14.1
 - B. 12.0-12.2
 - C. 11.0-11.5
 - D. 13.0-13.5
- 9. When performing a loaded voltage output test, voltage should be about how much above open circuit voltage?**
- A. 500 mV above open circuit voltage
 - B. 50 mV below open circuit voltage
 - C. Equal to open circuit voltage
 - D. 1 V above open circuit voltage
- 10. Which statement is correct about using standard bolts as battery terminal adapters with testing equipment and about attaching cable connections to the battery terminals?**
- A. Both A and B
 - B. A only
 - C. B only
 - D. Neither A nor B

Answers

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

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Explanations

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1. Which of the following is NOT a reason to disconnect power before measuring resistance?

- A. To Prevent Damage To The Meter
- B. To Avoid Electrical Shock
- C. To Obtain An Accurate Measurement
- D. To Ensure The Circuit Remains Energized**

When you measure resistance, you want the reading to reflect only the component's resistance, not any currents or voltages from a live circuit. The meter applies a small current through the part and measures the resulting voltage drop to calculate resistance. If power is on, other sources can drive current through the path, giving a distorted, meaningless reading and potentially stressing the meter's input. Disconnecting power also reduces the risk of electrical shock and protects the meter from damage that can occur if live voltage is present on the measurement terminals. So keeping the circuit energized is not a valid reason for measuring resistance; it undermines accuracy and safety.

2. In a circuit with an open switch, which statement is true?

- A. No voltage will exist anywhere in the circuit when the switch is open.
- B. The entire circuit still has the supply voltage when the switch is open.
- C. Only the supply side remains energised when the switch is open.
- D. There can be voltage present in at least part of the circuit when the switch is open.**

When a circuit has an open switch, current stops because the path is interrupted, but the power source still creates a potential difference. That means voltage can exist at various points in the circuit even though no current is flowing. You could measure the full supply voltage across the open gap or on the side still connected to the source, while other parts may sit at different potentials. So it's possible for voltage to be present in at least part of the circuit with the switch open.

3. An example of a rheostat is:

- A. Ignition switch
- B. Relay
- C. Instrument panel dimmer switch**
- D. Brake light switch

A rheostat is a device that varies resistance to control the current in a circuit. In cars, the instrument panel dimmer switch uses this principle to adjust dash-light brightness by increasing or decreasing the resistance in the lighting circuit, which changes how much current reaches the instrument lights. That makes the instrument panel dimmer switch the best example of a rheostat. Other items listed aren't variable resistors: the ignition switch simply connects power in a selective way, a relay is an electromagnetic switch, and the brake light switch functions as a sensor that turns lights on when the pedal is pressed.

4. A blower motor fuse blows after replacing the motor. The problem could be:

A. lower resistance in the new motor than the original part

B. defective fuse

C. wiring harness damaged

D. switch stuck

The key idea is that the fuse protects the circuit from overcurrent, so a motor that draws more current than the circuit is designed to handle will blow the fuse. If the new blower motor has lower winding resistance than the original, it pulls more current at the same supply voltage (Ohm's law: $\text{current} = \text{voltage} / \text{resistance}$). That increased current can exceed the fuse's rating and cause it to open. To check, compare the new motor's winding resistance to the spec for the original motor; a significantly lower reading or a shorted winding confirms why the fuse trips. While a defective fuse, damaged wiring, or a stuck switch could cause problems, the most direct and common cause after replacing the motor is a lower resistance in the new motor leading to higher current draw and a blown fuse.

5. Open circuit voltage at about 25% state of charge is approximately which value?

A. 12.06 volts

B. 12.50 volts

C. 11.80 volts

D. 13.00 volts

Open circuit voltage reflects how much charge is stored in a lead-acid battery when no load is on it and it's given time to rest. For a typical 12V lead-acid battery, the voltage rises as the battery's state of charge increases. At about 25% charge, the resting voltage is approximately 12.06 volts, making that value the best match for the question. If you see around 12.50 volts, you're at a higher state of charge (roughly mid-to-high), not 25%. A reading near 11.80 volts indicates the battery is fairly discharged, while about 13.00 volts suggests the battery is being charged or has a surface charge from recent charging.

6. Which statements about door lock actuation are correct?

A. A only

B. B only

C. Both A and B

D. Neither

Door lock actuation is about how the latch is moved to lock or unlock the door, and it can be done by manual linkages or by electric or other actuators. If both statements describe valid aspects of how the latch can be driven—such as a mechanical path moving the latch directly and an electric actuator that also moves the latch—then the combined option is the right choice. In vehicle systems, it's common to have multiple ways to actuate a lock and to consider how each method affects reliability, speed, and safety (for example, the ability to override electronically with a manual operation if power is lost). Since both described aspects reflect real, workable ways doors can be actuated, choosing the option that says both are correct aligns with how door lock actuation is implemented.

7. Which technology do rain sensors use to detect moisture?

- A. Infrared beams**
- B. Ultrasonic waves
- C. Capacitance changes
- D. Mechanical contacts

Rain sensors detect moisture using optical sensing with infrared light. An infrared emitter sends a beam across the windshield to a receiver. When the windshield is clear, most of the infrared light reaches the detector; when droplets are present, they scatter and absorb the light, causing the signal at the receiver to drop. The control unit interprets that change as rain and can trigger or adjust the wipers. The other options aren't typical for detecting windshield moisture: ultrasonic would use sound waves and echoes, which isn't how rain on glass is detected; capacitance changes would require a specific sensor layout to measure dielectric changes from moisture, which isn't the common automotive rain-sensing method; and mechanical contacts would need water to bridge a switch, which is unreliable and prone to wear.

8. When the engine is off and the alternator is not operating, the typical battery terminal voltage is about which range?

- A. 14.0-14.1
- B. 12.0-12.2**
- C. 11.0-11.5
- D. 13.0-13.5

When the engine is off and the alternator isn't charging, you're measuring the battery's resting, open-circuit voltage. A 12-volt lead-acid battery that isn't being charged typically reads around 12 volts. In practice, a common resting range is about 12.0 to 12.2 volts, which is why that option is the best fit. The other ranges reflect charging conditions (13–14 volts) or a heavily discharged battery (around 11 volts).

9. When performing a loaded voltage output test, voltage should be about how much above open circuit voltage?

- A. 500 mV above open circuit voltage**
- B. 50 mV below open circuit voltage
- C. Equal to open circuit voltage
- D. 1 V above open circuit voltage

When you test voltage under load, you're checking how the source behaves when current is drawn from it. The open-circuit voltage is what you read with no load. Once a load is applied, there are resistances in the source, wiring, and connections that cause a voltage drop. To ensure the device at the test point still sees the correct voltage, the test procedure targets the source delivering about half a volt more than the open-circuit value. That small headroom compensates those drops so the loaded voltage stays within the intended range. A difference of around 0.5 V is large enough to cover typical wiring and contact losses but not so large as to risk over-voltage. Smaller differences wouldn't reliably compensate for losses, an exact match to open-circuit wouldn't account for the drop under load, and a full volt above would unnecessarily push the source beyond what's needed.

10. Which statement is correct about using standard bolts as battery terminal adapters with testing equipment and about attaching cable connections to the battery terminals?

A. Both A and B

B. A only

C. B only

D. Neither A nor B

When working with battery terminals, use hardware and adapters that are specifically designed for automotive terminals and testing equipment. Using standard bolts as adapters can create a poor, unreliable connection: the bolt may not fit snugly, it can damage the terminal, and it can loosen under vibration or cause increased contact resistance. Proper practice relies on correctly sized clamps or lug assemblies and clean, secure connections for testing leads. If either statement suggests using improvised bolts as adapters or attaching cables directly to the battery posts without appropriate lugs or clamps, those practices aren't considered correct. I need the exact wording of the two statements to explain precisely why neither is correct.

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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:

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

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