

Metropolitan Transportation Authority (MTA) Electrical Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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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. A metallic connection with the earth to establish ground potential is called what?**
 - A. Neutral**
 - B. Insulation**
 - C. Ground**
 - D. Bond**

- 2. What term describes the measure of the ease with which magnetic lines of force can flow through a material compared to air?**
 - A. Overload**
 - B. Permeability**
 - C. Phase difference**
 - D. Polarity**

- 3. Which term is defined as the complete path that an electric current travels along?**
 - A. Bus bar**
 - B. Coaxial cable**
 - C. Capacitor**
 - D. Circuit**

- 4. Which color corresponds to the value 8?**
 - A. Black**
 - B. Brown**
 - C. Gray**
 - D. Blue**

- 5. Which term describes a solution of a substance capable of conducting electricity?**
 - A. Conductor**
 - B. Insulator**
 - C. Electrolyte**
 - D. Semiconductor**

- 6. A device that uses an electromagnet to measure electric current is called what?**
- A. Ammeter**
 - B. Galvanometer**
 - C. Voltmeter**
 - D. Multimeter**
- 7. Resistance is additive in a series circuit.**
- A. Multiplicative**
 - B. Zero**
 - C. Additive**
 - D. Inversely proportional**
- 8. The mnemonic phrase is used to remember resistor color codes. Which component uses color codes that this mnemonic helps remember?**
- A. Resistors**
 - B. Capacitors**
 - C. Diodes**
 - D. Inductors**
- 9. The basic unit of inductance is called what?**
- A. Ohm**
 - B. Siemens**
 - C. Farad**
 - D. Henry**
- 10. Which device uses a small DC current to control a larger AC current?**
- A. Rectifier**
 - B. Saturable reactor**
 - C. Rheostat**
 - D. Relay**

Answers

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

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Explanations

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1. A metallic connection with the earth to establish ground potential is called what?

- A. Neutral**
- B. Insulation**
- C. Ground**
- D. Bond**

Grounding is the practice of creating a metallic connection to the earth to set a known reference potential and provide a low-impedance path for fault current. This establishes ground potential and helps protective devices trip quickly to protect people and equipment. The term described is ground. Neutral is the current-carrying return path and may be bonded to earth at specific points; insulation is non-conductive material; bonding links conductive parts to prevent dangerous voltage differences, often tied into the grounding system, but the act of connecting to earth to establish the reference is ground.

2. What term describes the measure of the ease with which magnetic lines of force can flow through a material compared to air?

- A. Overload**
- B. Permeability**
- C. Phase difference**
- D. Polarity**

Permeability is the property that tells you how easily magnetic flux lines can pass through a material. When you compare a material to air (or vacuum), you're looking at how much the material concentrates or channels magnetic flux relative to air, which is captured by its relative permeability $\mu_r = \mu/\mu_0$. Materials with higher permeability—like iron—present less reluctance to the magnetic flux, so flux flows through them more readily. This concept is why magnetic cores in transformers and inductors use high-permeability materials to maximize magnetic coupling. The other terms don't describe how easily flux passes through a material: overload relates to current capacity, phase difference to timing in AC signals, and polarity to the direction of potential or field.

3. Which term is defined as the complete path that an electric current travels along?

- A. Bus bar
- B. Coaxial cable
- C. Capacitor
- D. Circuit**

The main idea here is understanding what provides the complete path for electrical current to flow. A circuit is that complete loop—an uninterrupted path that starts at a power source, travels through conductors to a load or device, and returns to the source. This closed loop allows continuous current flow; if the loop is broken, the current stops because there's no return path. In practice, a bus bar is a large conductor used to distribute power to many circuits, but it's only part of the network, not the full current path. A coaxial cable is used for signal transmission rather than serving as the primary current loop for power delivery. A capacitor stores energy and affects current temporarily during charging or discharging, but it does not define the complete, ongoing path for current in a circuit.

4. Which color corresponds to the value 8?

- A. Black
- B. Brown
- C. Gray**
- D. Blue

Color-to-digit mapping used on resistors is what this item tests. In the standard color code, the digits are assigned as follows: black 0, brown 1, red 2, orange 3, yellow 4, green 5, blue 6, violet 7, gray 8, white 9. Therefore the color for the value eight is gray. This makes gray the correct choice. The other colors correspond to different digits: black is 0, brown is 1, blue is 6, so they don't represent eight. Keep this mapping in mind when reading resistor color bands or similar markings in electrical work.

5. Which term describes a solution of a substance capable of conducting electricity?

- A. Conductor
- B. Insulator
- C. Electrolyte**
- D. Semiconductor

When a substance dissolves and splits into ions, the resulting solution can carry electric current because the moving ions act as charge carriers. That kind of solution is called an electrolyte. This distinguishes it from a conductor, which refers to a material that lets electrons move through it; an insulator, which resists electrical flow; and a semiconductor, whose conductivity is intermediate and typically depends on conditions. So the term for a solution capable of conducting electricity due to dissolved ions is electrolyte.

6. A device that uses an electromagnet to measure electric current is called what?

- A. Ammeter
- B. Galvanometer**
- C. Voltmeter
- D. Multimeter

Measuring current through magnetic deflection is the hallmark of a galvanometer. A galvanometer has a coil that carries the current and sits in a magnetic field; the interaction between the magnetic field and the current produces a torque that makes the coil—and the attached pointer—deflect. The amount of deflection is proportional to the current, giving a direct readout of how strong the current is. An ammeter also measures current, but in practice it's built around a galvanometer with a low-value shunt to handle larger currents without wasting voltage. A voltmeter, by contrast, targets voltage and uses a high-resistance path to limit current draw, while a multimeter can measure several quantities but isn't defined by the electromagnet-based current sensing on its own.

7. Resistance is additive in a series circuit.

- A. Multiplicative
- B. Zero
- C. Additive**
- D. Inversely proportional

In a series circuit, the total resistance is the sum of the individual resistances. This happens because the same current flows through every component, and each resistor drops a portion of the total voltage proportional to its resistance. Using $V = IR$, the voltage across each resistor is $V_i = I R_i$. The total supply voltage is the sum of these drops: $V_{total} = V_1 + V_2 + \dots = I(R_1 + R_2 + \dots)$. But V_{total} also equals I times the total resistance, $V_{total} = I R_{total}$. Since the current is not zero, you can cancel I and get $R_{total} = R_1 + R_2 + \dots$. So the total resistance adds up. Example: two resistors of 2Ω and 3Ω in series give a total of 5Ω . With a 10 V source, the current is 2 A , and the voltage drops are 4 V and 6 V , which add to the total supply voltage. The additive description matches this behavior. Multiplicative, zero, or inversely proportional would not describe how resistance behaves in a series path.

8. The mnemonic phrase is used to remember resistor color codes. Which component uses color codes that this mnemonic helps remember?

- A. Resistors**
- B. Capacitors**
- C. Diodes**
- D. Inductors**

The mnemonic is used to remember the color-to-number order for resistor markings, and resistors are the components that use color bands to indicate their resistance value, tolerance, and sometimes temperature coefficient. The first two bands give digits, the third is the multiplier, and the fourth shows tolerance, so the mnemonic helps you translate those bands into an actual resistance in ohms. Capacitors, diodes, and inductors don't follow this standardized color-band scheme for marking their values, so they aren't the subject of this mnemonic. Thus, the component that uses color codes remembered by this mnemonic is the resistor.

9. The basic unit of inductance is called what?

- A. Ohm**
- B. Siemens**
- C. Farad**
- D. Henry**

Inductance is measured in henries. The defining idea is that the voltage across an inductor is proportional to how quickly the current changes: $v = L di/dt$. A value of one henry means a current changing at one ampere per second induces one volt of EMF, so $L = 1 \text{ V}\cdot\text{s}/\text{A}$. In practical terms, you'll see inductors rated in millihenries or microhenries. The other units correspond to different properties: ohm is resistance, siemens is conductance, and farad is capacitance.

10. Which device uses a small DC current to control a larger AC current?

- A. Rectifier**
- B. Saturable reactor**
- C. Rheostat**
- D. Relay**

A saturable reactor changes how much current can flow in an AC circuit by using a small DC bias to alter the magnetic core's properties. The DC current magnetizes the core and pushes it toward saturation, which reduces the core's permeability and lowers the inductive reactance the AC current sees. Because inductive reactance determines how much AC current passes for a given voltage, shifting the DC bias lets you regulate a larger AC current with a relatively tiny control current. In other words, a small DC current sets the level of a larger AC current by changing the impedance in the AC path. This is different from a relay, which uses a small DC current to operate a switch that controls a separate, larger AC circuit in an on/off manner rather than continuously varying the AC current. It also isn't a rectifier, which converts AC to DC, or a rheostat, which is simply a variable resistor in the same current path without magnetic saturation control.

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://mtaelectrical.examzify.com>

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

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