METROPOLITAN TRANSPORTATION AUTHORITY (MTA) ELECTRICAL 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

1. **Which term refers to a third winding on a transformer used as a second control winding?**

   A. Transformer

   B. Tertiary Winding

   C. Thermistor

   D. Servo

2. **Which device converts a small movement into a larger movement or force?**

   A. Servo

   B. Servomechanism

   C. Solenoid

   D. Transformer

3. **Which term refers to an area equal to that of a circle with a 0.001 inch diameter?**

   A. Conductor

   B. Conductivity

   C. Circular Mil

   D. Capacitor

4. **Which term is defined as the ability of a material to conduct or carry an electric current?**

   A. Conductivity

   B. Conductance

   C. Bus bar

   D. Circuit

5. **Which term describes the circulating currents induced in a conductor by a changing magnetic field?**

   A. Faraday effect

   B. Magnetic braking

   C. Eddy Current

   D. Inductive coupling

6. Band D on a resistor color code represents which property?

A. First digit

B. Tolerance

C. Decimal multiplier

D. Second digit

7. Which instrument measures electrical power in watts?

A. Wattmeter

B. Multimeter

C. Voltmeter

D. Ammeter

8. Which device is composed of two or more coils linked by magnetic lines of force used to transfer energy between circuits?

A. Servo

B. Thermistor

C. Synchro System

D. Transformer

9. Which color corresponds to the value 7?

A. White

B. Violet

C. Red

D. Orange

10. What is the general term for the ability to do work?

A. Energy

B. Power

C. Force

D. Momentum

Answers

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

Explanations

1. Which term refers to a third winding on a transformer used as a second control winding?

A. Transformer

B. Tertiary Winding

C. Thermistor

D. Servo

In transformers, you can add an extra winding beyond the primary and secondary. That third winding is called a tertiary winding. It serves as an auxiliary or control winding, providing power for control circuitry or biasing while keeping it isolated from the main power path. This makes it ideal for supplying a second control circuit or feedback without loading the main secondary. The other terms don't fit because they aren't windings on a transformer: a transformer is the device itself, a thermistor is a temperature dependent resistor, and a servo is a motor/actuator.

2. Which device converts a small movement into a larger movement or force?

A. Servo

B. Servomechanism

C. Solenoid

D. Transformer

The thing being tested is how a small input can be turned into a larger, controlled motion or force through an actuator with feedback. A servo is designed for exactly that: a compact control signal drives a motor, and through gearing and a feedback loop, the output shaft moves much more precisely and with greater torque than the input would suggest on its own. The small movement commanded by the control system is amplified by the motor and gears, while the feedback keeps the output in line with the desired position. A servomechanism describes the whole closed-loop system that uses feedback to achieve accurate control, but the device that actually provides the amplified motion is the servo motor (the actuator). A solenoid would give direct linear motion without the amplification and precise control, a transformer handles electrical energy conversion rather than motion, and while a servomechanism involves feedback, it isn't the actuator itself.

3. Which term refers to an area equal to that of a circle with a 0.001 inch diameter?

A. Conductor

B. Conductivity

C. Circular Mil

D. Capacitor

Circular mil is a unit of cross sectional area for wires. It's defined as the area of a circle with a diameter of 0.001 inch. If you take that circle, its radius is 0.0005 inch and its area is π × (0.0005)^2 ≈ 7.85 × 10^-7 square inches. By definition, that area corresponds to one circular mil. In practice, you'll see wire sizes expressed in circular mils, and the quick relation is (diameter in inches × 1000)^2 equals the area in circular mils. So a wire with a 0.001 inch diameter has 1 circular mil. The other terms refer to different concepts (a conductor is a type of component, conductivity is a material property, capacitor is a component), not this unit of area.

4. Which term is defined as the ability of a material to conduct or carry an electric current?

A. Conductivity

B. Conductance

C. Bus bar

D. Circuit

Conductivity is the material's property that describes how easily electrons can move through it and carry current. It's a intrinsic characteristic of the substance, with higher conductivity meaning less opposition to current flow. The higher the conductivity, the better the material conducts electricity, which is why metals like copper are used for wires. Conductivity is the reciprocal of resistivity ($\sigma = 1/\rho$) and is measured in siemens per meter (S/m). Conductance, by contrast, refers to how easily current flows through a specific path or component and depends on both the material and its size/shape; it's measured in siemens (S) and is not the material's intrinsic property. A bus bar is simply a large conductor used to distribute power, and a circuit is a closed loop that current travels through.

5. Which term describes the circulating currents induced in a conductor by a changing magnetic field?

A. Faraday effect

B. Magnetic braking

C. Eddy Current

D. Inductive coupling

Eddy currents are circulating currents that form inside a conductor when the magnetic flux through it changes. According to Faraday's law, a changing magnetic field induces an emf around closed paths in the material, so currents loop within the conductor. These currents generate their own magnetic fields that oppose the original change in flux (Lenz's law), and they tend to cause heating and energy losses in electrical equipment. The other terms don't describe this internal looping current: the Faraday effect is about rotation of light's polarization in a material, magnetic braking is a use of those currents to slow motion, and inductive coupling refers to energy transfer between circuits via mutual magnetic fields rather than currents circulating inside a single conductor.

6. Band D on a resistor color code represents which property?

A. First digit

B. Tolerance

C. Decimal multiplier

D. Second digit

The last color band on a standard resistor tells you the tolerance—the allowed variation from the stated resistance value. In a typical four-band code, the first two bands give the digits of the resistance, the third band is the multiplier that scales those digits, and the fourth band is the tolerance. This tolerance tells you how precise the resistor is and how far the actual resistance can deviate from the printed value. For example, if that last band indicates 5% tolerance, a resistor labeled for a 330-ohm value could measure anywhere roughly from 313 to 347 ohms. The other bands establish the numeric value: the first two bands are the significant digits, and the third band sets the multiplier.

7. Which instrument measures electrical power in watts?

A. Wattmeter

B. Multimeter

C. Voltmeter

D. Ammeter

Measuring electrical power in watts is done with a wattmeter. It directly reads real power by incorporating both the circuit voltage and current and accounting for their phase relationship. In AC systems, power is not just about how much current or how high the voltage is; it also depends on how in- or out-of-phase they are (the power factor). A wattmeter has a voltage element connected across the supply and a current element in series with the load, and its indication corresponds to P = V × I × cos(phi). A voltmeter only shows voltage, an ammeter only shows current, and a multimeter can measure those quantities but normally requires you to calculate power yourself. Hence, the instrument that measures power in watts is the wattmeter.

8. Which device is composed of two or more coils linked by magnetic lines of force used to transfer energy between circuits?

A. Servo

B. Thermistor

C. Synchro System

D. Transformer

Energy transfer between circuits through magnetic coupling using two or more coils is what a transformer does. When alternating current flows in the primary winding, it creates a changing magnetic flux in the core. That flux links the secondary winding and induces a voltage there. The voltage ratio follows the turns ratio of the windings, Vp/Vs = Np/Ns, and the currents adjust inversely so that power is conserved (minus losses). This lets you step voltage up or down, provide isolation, or match impedances between circuits. Other devices listed don't fit this description. A servo is an actuator used for precise motion control, not just energy transfer between circuits. A thermistor is a temperature-dependent resistor, with no magnetic coupling. A synchro system uses electromagnetic coupling for position indication, but its primary purpose is sensing angle rather than transferring energy between circuits.

9. Which color corresponds to the value 7?

A. White

B. Violet

C. Red

D. Orange

Color digits are read by a standard color-to-number mapping: Black 0, Brown 1, Red 2, Orange 3, Yellow 4, Green 5, Blue 6, Violet 7, Gray 8, White 9. This scheme is used on resistors and many electrical components to quickly identify values. Since seven corresponds to Violet in this scale, Violet is the color that represents the value 7. The other colors map to different digits (for example, Orange is 3, Red is 2, White is 9), so they do not represent seven.

10. What is the general term for the ability to do work?

A. Energy

B. Power

C. Force

D. Momentum

Energy is the general term for the ability to do work. Work is the transfer of energy that occurs when a force moves an object over a distance, so energy is the capacity that enables that transfer to happen. Energy comes in many forms, such as kinetic energy in moving objects or potential energy stored in stretched springs or chemical energy in fuels. When energy changes form, the total amount stays the same in a closed system, which is the idea of energy conservation. Power is about how fast work is done, the rate of energy transfer. Force is what causes changes in motion, but it's not a measure of the ability to do work by itself. Momentum describes motion (mass times velocity) and is especially relevant in collisions, but it isn't the general term for the capacity to perform work.

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!