

MTA Transit Electrical Helper (Exam No. 4612) Practice Exam (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. Which type of motor is most likely to reach a dangerous speed when operated at normal voltage and no load?**
 - A. Shunt motor**
 - B. Series motor**
 - C. Split-phase motor**
 - D. Induction motor**

- 2. While lifting heavy equipment, what action should be avoided to ensure safety?**
 - A. Keeping a straight back**
 - B. Locking the knees**
 - C. Twisting the body**
 - D. Using legs to lift**

- 3. Which AWG size of single conductor bare copper wire has the lowest resistance per foot?**
 - A. #14**
 - B. #00**
 - C. #10**
 - D. #12**

- 4. What instrument should be used to measure the state of charge of a lead acid storage battery?**
 - A. Voltmeter**
 - B. Amperemeter**
 - C. Hydrometer**
 - D. Multimeter**

- 5. Which electrical device is not normally used in direct current circuits?**
 - A. Capacitor**
 - B. Transformer**
 - C. Resistor**
 - D. Diode**

- 6. What is the main reason for wearing safety gear while performing electric welding?**
- A. To comply with insurance regulations**
 - B. To prevent injury from sparks and heat**
 - C. To maintain clean work conditions**
 - D. To ensure high-quality welding**
- 7. If switches W, X, Y, and Z are closed suddenly, what will occur?**
- A. The lamp will stay off and the motor will not rotate**
 - B. The lamp will light but the motor will not rotate**
 - C. The lamp will light and the motor will rotate**
 - D. The motor will rotate but the lamp will stay off**
- 8. What do the abbreviations ID and OD refer to when describing conduit?**
- A. Internal diameter and outer diameter**
 - B. Indirect diameter and overall diameter**
 - C. Inner diameter and outer design**
 - D. Instrumentation diameter and operational diameter**
- 9. What does a microfarad measure in relation to condensers?**
- A. Voltage**
 - B. Current**
 - C. Resistance**
 - D. Capacity**
- 10. To accurately measure the small gap between relay contacts, which tool is the most suitable?**
- A. Caliper**
 - B. Feeler gauge**
 - C. Micrometer**
 - D. Ruler**

Answers

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

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Explanations

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1. Which type of motor is most likely to reach a dangerous speed when operated at normal voltage and no load?

- A. Shunt motor**
- B. Series motor**
- C. Split-phase motor**
- D. Induction motor**

The series motor is specifically designed such that the field winding is connected in series with the armature winding. This configuration results in the field strength being directly proportional to the armature current. When a series motor operates under no load conditions, the current through the armature decreases significantly. Consequently, the magnetic field weakens, which leads to an increase in speed, as there is less back EMF generated to oppose the armature current. At normal voltage, with minimal resistance or load, the series motor can accelerate uncontrollably, reaching dangerous speeds very quickly. The lack of a sufficient magnetic field combined with the high speed can result in mechanical failure or damage to the motor. Thus, among the various types of motors, a series motor poses the most risk of reaching dangerously high speeds when operated at normal voltage and no load.

2. While lifting heavy equipment, what action should be avoided to ensure safety?

- A. Keeping a straight back**
- B. Locking the knees**
- C. Twisting the body**
- D. Using legs to lift**

Twisting the body while lifting heavy equipment is an action that should be avoided to ensure safety. Twisting can put excessive strain on the lower back and increase the risk of injury. When lifting, it is crucial to maintain a stable and controlled posture, which includes keeping the back straight and using the legs to do the lifting. Engaging the core muscles while maintaining a straight line in the body helps distribute the weight more evenly and minimizes the risk of muscle strain or injury. In contrast, maintaining a straight back and using the legs for lifting are safe practices that promote good body mechanics during manual handling tasks. Locking the knees should also be avoided, as it can restrict movement and increase the risk of falls or other injuries. Therefore, ensuring that the lifting technique prioritizes body stability and alignment contributes significantly to personal safety when handling heavy objects.

3. Which AWG size of single conductor bare copper wire has the lowest resistance per foot?

- A. #14
- B. #00**
- C. #10
- D. #12

The correct choice, which indicates that #00 AWG size of single conductor bare copper wire has the lowest resistance per foot, is based on the characteristics of wire gauge and resistance. As the American Wire Gauge (AWG) number decreases, the diameter of the wire increases, which leads to a decrease in the resistance of the wire. This is due to the fact that a larger diameter allows more current to pass through with less opposition. Thus, #00 AWG is thicker than #14, #10, and #12 AWG, resulting in the lowest resistance per foot among the available options. Understanding this relationship between wire gauge, diameter, and resistance is crucial for applications in electrical wiring and for ensuring the efficiency and safety of electrical systems. Choosing the appropriate wire gauge is essential for minimizing power loss and overheating in electrical applications, making the knowledge of wire resistance vital for anyone working in electrical fields.

4. What instrument should be used to measure the state of charge of a lead acid storage battery?

- A. Voltmeter
- B. Amperemeter
- C. Hydrometer**
- D. Multimeter

A hydrometer is the appropriate instrument for measuring the state of charge of a lead acid storage battery because it assesses the specific gravity of the electrolyte solution within the battery. The specific gravity indicates the concentration of sulfuric acid in the electrolyte, which varies according to the state of charge. By measuring the density of the liquid, a hydrometer can effectively determine how fully charged or discharged the battery is. In contrast, a voltmeter measures the voltage across the battery terminals but does not provide a direct indication of the electrolyte's specific gravity or the state of charge in a lead acid battery. An amperemeter measures the current flowing into or out of the battery, which does not directly correlate to the state of charge. A multimeter can also measure voltage and current, but it would not give the specific gravity reading necessary to ascertain the battery's charge level effectively, making the hydrometer the most suitable tool for this particular task.

5. Which electrical device is not normally used in direct current circuits?

A. Capacitor

B. Transformer

C. Resistor

D. Diode

The transformer is not normally used in direct current (DC) circuits because it relies on the principle of electromagnetic induction, which requires alternating current (AC) to function effectively. Transformers work by converting AC voltage levels up or down using mutual induction between coils. Since DC does not alternate, it does not produce the changing magnetic fields necessary for a transformer to operate. On the other hand, capacitors, resistors, and diodes are commonly used in DC circuits. Capacitors can store and release energy in DC applications, resistors are utilized to limit current flow, and diodes allow current to flow in only one direction, which is essential for controlling current in DC circuits. Therefore, the correct choice stems from recognizing the fundamental operational principles of these devices in relation to the nature of direct current.

6. What is the main reason for wearing safety gear while performing electric welding?

A. To comply with insurance regulations

B. To prevent injury from sparks and heat

C. To maintain clean work conditions

D. To ensure high-quality welding

Wearing safety gear while performing electric welding is essential primarily to prevent injury from the intense heat and flying sparks generated during the welding process. Welding involves high-temperature arcs that can produce molten metal droplets and radiant heat, which pose significant risks to the welder. Safety gear, such as welding helmets, gloves, and protective clothing, acts as a barrier, protecting the welder's skin and eyes from burns and other injuries. While compliance with insurance regulations or maintaining clean work conditions may be important for various aspects of work safety and order, they are not the main focus during welding activities. Similarly, ensuring high-quality welding is crucial but secondary to the immediate concern for personal safety in preventing physical harm during the operation. The primary goal of wearing safety gear is the direct protection it provides against the hazards specific to welding.

7. If switches W, X, Y, and Z are closed suddenly, what will occur?

- A. The lamp will stay off and the motor will not rotate
- B. The lamp will light but the motor will not rotate
- C. The lamp will light and the motor will rotate**
- D. The motor will rotate but the lamp will stay off

When switches W, X, Y, and Z are all closed simultaneously, the circuit completes a path for both the lamp and the motor, assuming that these components are connected in such a manner that both are powered by the same circuit. If the motor is designed to operate when a specific voltage is applied and, when closed, the switches allow current to flow through both the lamp and the motor, then the lamp will light due to the flow of current, and the motor will rotate as it receives the voltage necessary for operation. In this scenario, the simultaneous closing of the switches creates a conductive path, thereby activating both the lamp and the motor. This means that both devices will respond positively to the supplied electrical power, leading to a functioning lamp and a rotating motor, which corresponds to the indicated choice.

8. What do the abbreviations ID and OD refer to when describing conduit?

- A. Internal diameter and outer diameter**
- B. Indirect diameter and overall diameter
- C. Inner diameter and outer design
- D. Instrumentation diameter and operational diameter

The abbreviations ID and OD refer to Internal Diameter and Outer Diameter, respectively, when describing conduit. Understanding these terms is essential in electrical work as they relate to the sizing of conduits used for housing electrical wiring. Internal Diameter (ID) is the measurement of the inside space of the conduit, which is critical for determining how many wires or cables can be safely contained within it. An insufficient ID might lead to overcrowding, possibly resulting in heat buildup and increased risk of electrical failure. Outer Diameter (OD), on the other hand, refers to the measurement across the outer edges of the conduit. This dimension is essential for understanding how the conduit will fit within mounts, along walls, or in conjunction with other systems, ensuring that installation complies with codes and safety standards. The other options represent incorrect definitions that do not properly describe the standard industry terminology used in conduit specifications. Knowing the correct meanings allows workers to select the appropriate conduit size and type for their applications, which is fundamental to both safety and functionality in electrical installations.

9. What does a microfarad measure in relation to condensers?

- A. Voltage**
- B. Current**
- C. Resistance**
- D. Capacity**

A microfarad is a unit of measurement that quantifies the capacitance of a condenser, which is another term for a capacitor. Capacitance refers to the ability of a device to store an electric charge. When capacitance is measured in farads, microfarads (μF) represent one-millionth of a farad, making it a scale that is useful for measuring smaller capacitance values commonly found in electronic components. Capacitance indicates how much electrical energy can be stored in a capacitor for a given voltage across its plates. A higher capacitance value means that the capacitor can store more charge. Therefore, the correct answer signifies the role of microfarads as a measure of the capacity of a condenser to hold electrical energy, rather than measuring voltage, current, or resistance.

10. To accurately measure the small gap between relay contacts, which tool is the most suitable?

- A. Caliper**
- B. Feeler gauge**
- C. Micrometer**
- D. Ruler**

The feeler gauge is specifically designed for measuring small gaps and clearances, making it the most suitable tool for determining the spacing between relay contacts. This tool consists of a set of thin metal blades, each with a specific thickness, which can be inserted into the gap to find the exact distance. This level of precision is crucial in electrical applications to ensure that relays function correctly without improper contact or excessive wear. In contrast, while calipers and micrometers also provide measurements, they are generally better suited for measuring the dimensions of objects rather than small gaps. A ruler, on the other hand, lacks the precision required for such small measurements and is not an appropriate choice for determining the exact spacing of relay contacts. Overall, the feeler gauge's design and purpose make it the best option for this specific task.

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://mtahelper4612.examzify.com>

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

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