

# Independent Electrical Contractors (IEC) Year 3 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. Which type of motor can operate on either AC or DC power?
  - A. Universal
  - B. Capacitor-start
  - C. Split-phase
  - D. 3-phase
  
2. If an overload in a motor branch circuit persists for a long enough time, it can cause damage to the \_\_\_.
  - A. insulation on the motor windings
  - B. conductors supplying the motor
  - C. both of these
  - D. none of these
  
3. Which of the following methods is NOT acceptable for making equipment bonding jumper connections?
  - A. Exothermic welding
  - B. Sheet metal screws
  - C. Listed pressure connections
  - D. Listed clamps
  
4. At 1 pm, when in AUTO mode, which light is energized?
  - A. the white light
  - B. the green light
  - C. both white and green lights
  - D. neither white nor green lights
  
5. When the stop button is pressed, the control relay will \_\_\_.
  - A. deenergize and reenergize when the stop button is released
  - B. deenergize and stay deenergized until the start button is pressed again
  - C. not change states
  - D. activate the coil

- 6. What type of switch is typically used for emergency stops in industrial settings?**
- A. a. toggle switch**
  - B. b. momentary switch**
  - C. c. extended button under a cover**
  - D. d. rotary switch**
- 7. A computer network can be described as what?**
- A. Hardwired only**
  - B. Wireless only**
  - C. Either hardwired or wireless**
  - D. Neither**
- 8. During vehicle refueling, which factor is controlled by maintaining metal contact between the nozzle and filler neck?**
- A. The temperature of the fuel**
  - B. The flow rate**
  - C. Static electricity**
  - D. The vapor recovery**
- 9. Is a bonding jumper required from the ground bar to a set-screw connector in a specific installation scenario?**
- A. Yes**
  - B. No**
- 10. Calculate the overload size for a 230 Volt, single phase, 3 HP motor with a rating of 14 Amps.**
- A. 16.1**
  - B. 17.5**
  - C. 19.55**
  - D. 21.25**

## Answers

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

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## **Explanations**

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**1. Which type of motor can operate on either AC or DC power?**

- A. Universal**
- B. Capacitor-start**
- C. Split-phase**
- D. 3-phase**

A universal motor is specifically designed to operate on both alternating current (AC) and direct current (DC). This versatility comes from the construction of the motor, which typically features a series winding and a commutator that allows it to function efficiently with both types of current. Universal motors are often found in applications requiring high speed and variable speed control, such as in portable power tools and household appliances. In contrast, a capacitor-start motor is a type of induction motor that typically runs on AC power and requires a capacitor to start. It is not designed for operation with DC, limiting its application scope. A split-phase motor, which is also an AC motor, operates on single-phase alternating current and utilizes phase splitting to start, making it unsuitable for DC operation. Lastly, a 3-phase motor operates exclusively on three-phase alternating current and cannot function with direct current. Thus, the universal motor stands out as the only option that can efficiently use both AC and DC power sources.

**2. If an overload in a motor branch circuit persists for a long enough time, it can cause damage to the \_\_\_.**

- A. insulation on the motor windings**
- B. conductors supplying the motor**
- C. both of these**
- D. none of these**

When an overload occurs in a motor branch circuit, it results in excessive current flowing through the circuit components. This sustained current can generate significant heat within both the motor windings and the conductors supplying the motor. Over time, the heat can deteriorate the insulation on the motor windings, leading to insulation failure, short circuits, or even complete motor burnout. The conductors, too, are at risk; they can overheat, which may cause the insulation on the conductors to melt or degrade, thereby exposing the conductor and potentially creating a risk for electrical faults or shorts. Thus, the correct response encompasses the potential damage to both the insulation on the motor windings and the conductors supplying the motor due to long-term exposure to overload conditions. This highlights the importance of proper circuit protection, such as overload relays, to prevent such scenarios and protect both the motor and the wiring.

**3. Which of the following methods is NOT acceptable for making equipment bonding jumper connections?**

- A. Exothermic welding**
- B. Sheet metal screws**
- C. Listed pressure connections**
- D. Listed clamps**

The method of using sheet metal screws for making equipment bonding jumper connections is not acceptable. Equipment bonding involves ensuring that all conductive parts are connected to maintain grounding. The primary purpose is to ensure electrical continuity and avoid any potential differences in voltage that could lead to arcing or shock hazards. Using sheet metal screws can compromise this important function since they may not provide a reliable electrical connection over time, especially under conditions where vibration or thermal expansion may occur. They can loosen, corrode, or fail to maintain a secure bond, which is critical in bonding applications where safety is paramount. In contrast, the other methods mentioned—exothermic welding, listed pressure connections, and listed clamps—are recognized for their reliability and effectiveness in maintaining solid electrical connections. Exothermic welding creates a permanent connection that can withstand harsh conditions, while listed pressure connections and listed clamps are designed specifically to ensure that the bond is secure and durable, meeting safety standards set forth in electrical codes.

**4. At 1 pm, when in AUTO mode, which light is energized?**

- A. the white light**
- B. the green light**
- C. both white and green lights**
- D. neither white nor green lights**

In an automatic lighting control system, the state of the lights at 1 pm when in AUTO mode depends on the specific programming and sensor inputs of the system. If the output indicates that neither the white nor the green lights are energized, it suggests that, at that particular time, the conditions necessary for either light to be activated are not met. For example, if the white light is meant to signify daytime activities and the green light indicates a particular condition such as a status of readiness or safety, there may be a threshold that determines when each light turns on or off based on ambient light levels, operational status, or pre-set timers. In this scenario, at 1 pm, it is possible that enough natural light is present that the white light does not activate, or the conditions for the green light are not fulfilled, hence both lights remain off. The options that suggest one or both lights are energized could imply conditions not being currently met, such as insufficient light or readiness signals not being triggered at that specific time. The absence of light indicates an automatic response of the system to its environment, adhering to the intended operational parameters.

5. When the stop button is pressed, the control relay will \_\_\_\_.
- A. deenergize and reenergize when the stop button is released
  - B. deenergize and stay deenergized until the start button is pressed again**
  - C. not change states
  - D. activate the coil

When the stop button is pressed in a control circuit, the function of the control relay is typically to interrupt the power to the coil that energizes it. This action causes the relay to deenergize. Once the stop button has been pressed, the relay remains in a deenergized state, which means that it will not return to its energized position until a separate action, such as pressing the start button, is taken to restart the circuit. This is a fundamental concept in control systems, particularly in safety or operational circuits, where the intentional act of stopping a process should ensure that it does not restart until explicitly commanded. Thus, the relay will remain deenergized and inactive until the start button is pressed again, ensuring controlled operation and safety in the system.

6. What type of switch is typically used for emergency stops in industrial settings?
- A. a. toggle switch
  - B. b. momentary switch
  - C. c. extended button under a cover**
  - D. d. rotary switch

In industrial settings, emergency stop switches are designed to be easily accessible and highly visible, providing a quick and reliable means to shut down equipment in case of an emergency. The choice of an extended button under a cover aligns with these safety requirements. This type of switch is often red in color and has a distinct shape that makes it recognizable even in high-stress situations. The cover serves to prevent accidental activation but allows for immediate access when needed, enhancing operator safety. This design is crucial because it facilitates rapid response during emergencies, ensuring that operators can quickly stop machinery and equipment to prevent accidents or injuries. The prominence and protection offered by the covered button make it a preferred choice for these critical functions in various industrial environments.

7. A computer network can be described as what?
- A. Hardwired only
  - B. Wireless only
  - C. Either hardwired or wireless**
  - D. Neither

A computer network can be described as either hardwired or wireless because it encompasses both types of connections. Hardwired networks use physical cables, such as Ethernet cables, to connect devices, ensuring a stable and often faster connection suitable for high-bandwidth activities. On the other hand, wireless networks use radio waves to connect devices, providing greater mobility and convenience, allowing devices to connect without being physically tethered. By recognizing that a network can operate effectively through both methods, it becomes clear that they are not mutually exclusive; rather, they can complement each other depending on the requirements of the network environment. This flexibility in network setup allows for a variety of implementations tailored to specific needs, such as a home, office, or public space.

**8. During vehicle refueling, which factor is controlled by maintaining metal contact between the nozzle and filler neck?**

- A. The temperature of the fuel**
- B. The flow rate**
- C. Static electricity**
- D. The vapor recovery**

Maintaining metal contact between the nozzle and the filler neck during vehicle refueling is crucial for controlling static electricity. When fuel is pumped into the vehicle, it can generate static electricity due to the movement of fuel through the nozzle and into the tank. This buildup of static can create a spark, which poses a risk of fire or explosion if it ignites the fuel vapors present. By ensuring that there is a continuous metal contact between the nozzle and the filler neck, the static charge is effectively dissipated back to the ground. This grounding mechanism reduces the likelihood of static electricity accumulation and helps ensure a safer refueling process. The other factors mentioned, like temperature, flow rate, and vapor recovery, do not directly relate to the need for metal contact during refueling in the same way that static electricity does. While these factors are important in their own right, they do not address the primary safety concern of static electricity during the transfer of fuel.

**9. Is a bonding jumper required from the ground bar to a set-screw connector in a specific installation scenario?**

- A. Yes**
- B. No**

In a specific installation scenario, a bonding jumper from the ground bar to a set-screw connector is indeed required to ensure electrical safety and proper grounding. The primary objective of a bonding jumper is to create a low-resistance path to ground, thereby preventing potential differences that could lead to dangerous electric shock or equipment damage. When a set-screw connector is utilized, it typically holds wires or conductors securely within an enclosure. However, establishing a reliable ground path from the ground bar to the set-screw connector is essential because the connector itself may not provide good conductivity due to factors like corrosion or the loosening of the connection over time. The bonding jumper acts as a safeguard, ensuring that even if the set-screw connection fails, there is still a secure ground connection in place. Additionally, the National Electrical Code (NEC) often mandates bonding jumper requirements for various components to ensure a comprehensive grounding system. This helps in maintaining the integrity of the entire electrical system, minimizing shock hazards and enhancing system reliability. On the other hand, not incorporating a bonding jumper could compromise safety measures and violate electrical code requirements, leading to increased risks in the installation. Therefore, the requirement for a bonding jumper in this context reinforces best practices in electrical installations.

**10. Calculate the overload size for a 230 Volt, single phase, 3 HP motor with a rating of 14 Amps.**

**A. 16.1**

**B. 17.5**

**C. 19.55**

**D. 21.25**

To calculate the overload size for a given motor, you typically use the formula that considers the motor's full-load current. In this case, the motor's rating is 14 Amps. For overload protection sizing, the National Electrical Code (NEC) recommends that the overload protection be set between 125% to 150% of the motor's full-load current for standard motors. In this instance, we calculate 125% of the motor's current: 1. Calculate 125% of the rated full-load current:  $14 \text{ Amps} \times 1.25 = 17.5 \text{ Amps}$  This value, 17.5 Amps, serves as a guideline for the overload protection setting, as it is designed to prevent the motor from overheating while allowing for brief overload conditions, like startup surges. Given this calculation, the correct answer for the overload size should reflect this protection requirement and therefore aligns with the 17.5 value. While determining overload size, it's essential to evaluate that it can handle the demands of the motor during normal operations. The option of 16.1 does not appropriately reflect the 125% guideline recommended by the NEC

## 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](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://iecyar3.examzify.com>**

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

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