

ERJ-145 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. Which generators are driven from the right engine?**
 - A. Generators 2 and 4**
 - B. Generators 1 and 3**
 - C. Generators 1 and 4**
 - D. Generators 2 and 3**

- 2. How do you recover from a TRU fault while maintaining essential loads?**
 - A. Replace TRU in air.**
 - B. Turn off all loads and wait.**
 - C. Use the remaining TRU or battery to energize essential DC buses, verify AC sources, and progressively re-energize nonessential loads.**
 - D. Assume shutdown of essential loads.**

- 3. In electrical emergency, which statement best describes battery endurance?**
 - A. They can supply essential power for about 40 minutes**
 - B. They can supply essential power for about 20 minutes**
 - C. They can supply essential power for about 60 minutes**
 - D. They cannot supply essential power for more than 15 minutes**

- 4. Why is 400 Hz used for aircraft electrical systems?**
 - A. It reduces the weight of the airframe.**
 - B. It increases the frequency of the electrical system.**
 - C. It is primarily used to power cabin amenities during flight.**
 - D. It reduces the size and weight of transformers and motors and improves performance for avionics.**

- 5. What kind of maintenance actions might be required after a generator fault?**
 - A. Inspect generator and bus connections, verify TRU and inverter operation, check fuses/circuit breakers.**
 - B. Replace the airplane's engine.**
 - C. Adjust landing gear tension.**
 - D. Reroute fuel lines.**

- 6. What is the effect of engaging the Essential Power Button on the electrical emergency configuration?**
- A. No change to the auto transfer logic.**
 - B. Transfers power to non-essential loads.**
 - C. Powers all buses from battery sources.**
 - D. Overrides auto transfer to electrical emergency configuration and powers only the Essential Buses.**
- 7. The APU is electrically connected to which DC bus?**
- A. Left DC Bus**
 - B. Right DC Bus**
 - C. The Central DC Bus**
 - D. SHED BUSES**
- 8. With four or five generators online, what is the electrical arrangement?**
- A. Two isolated left and right networks with partial energization**
 - B. Three separate networks with all buses energized**
 - C. Two isolated left and right networks. All buses energized**
 - D. A single central bus powering all loads**
- 9. Which bus supplies power to the inverter?**
- A. Ground Service Bus**
 - B. DC Bus 1**
 - C. AC Bus 2**
 - D. Battery Bus**
- 10. How can you determine that automatic transfer has failed during a total loss of generators?**
- A. The cockpit indicators show a fault**
 - B. The displays don't lose power**
 - C. Emergency lights illuminate**
 - D. External power status changes**

Answers

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

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Explanations

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1. Which generators are driven from the right engine?

- A. Generators 2 and 4**
- B. Generators 1 and 3**
- C. Generators 1 and 4**
- D. Generators 2 and 3**

The engine-mounted electrical system uses two generator units per engine, driven through the engine's accessory gear box. The numbering is paired with the engine location: the left engine powers generators 1 and 3, while the right engine powers generators 2 and 4. So the generators driven from the right engine are the two on that side, numbered 2 and 4. This arrangement provides redundancy and allows cross-connecting to essential buses if one side or the other has an issue.

2. How do you recover from a TRU fault while maintaining essential loads?

- A. Replace TRU in air.**
- B. Turn off all loads and wait.**
- C. Use the remaining TRU or battery to energize essential DC buses, verify AC sources, and progressively re-energize nonessential loads.**
- D. Assume shutdown of essential loads.**

Maintaining essential loads is the priority when a TRU fault occurs. In this situation, you use the remaining TRU (or the battery) to keep the essential DC buses energized, which powers the critical aircraft systems you must have during flight. Once those essential buses are powered, you verify that the AC sources (like the engines or APU-driven generators) are healthy and able to support the system, then bring nonessential loads back online gradually. This approach preserves flight-critical functions while safely restoring other systems, avoiding sudden surges or overloads. Replacing the TRU in air isn't an immediate, practical fix during flight. Turning off all loads and waiting would deprive essential systems of power and isn't acceptable for safe operations. Assuming shutdown of essential loads would similarly leave you without the minimum power necessary to fly and navigate.

3. In electrical emergency, which statement best describes battery endurance?

- A. They can supply essential power for about 40 minutes**
- B. They can supply essential power for about 20 minutes**
- C. They can supply essential power for about 60 minutes**
- D. They cannot supply essential power for more than 15 minutes**

Battery endurance is how long the battery can supply essential power after the aircraft loses normal power sources. For the ERJ-145, when only the battery remains powering the essential bus, the system is designed to sustain those critical loads for about 40 minutes. This window gives the crew time to restore power sources (like the APU or external power) or complete procedures to land safely, while keeping essential flight instruments and critical systems powered. The exact duration depends on how much load is on the essential bus. If nonessential equipment is left on, the endurance shortens; if loads are shed to only the required essentials, you might approach the typical 40-minute figure. Shorter durations (around 20 minutes or 15 minutes) would imply heavier load or poorer battery state, while longer durations (60 minutes) aren't representative of normal essential-load endurance.

4. Why is 400 Hz used for aircraft electrical systems?

- A. It reduces the weight of the airframe.**
- B. It increases the frequency of the electrical system.**
- C. It is primarily used to power cabin amenities during flight.**
- D. It reduces the size and weight of transformers and motors and improves performance for avionics.**

The main idea is that higher frequency lets you build smaller, lighter magnetic components for the same power. At 400 Hz, transformers, generators, and small motors can use much smaller cores and windings than they would at 50/60 Hz. That means less iron, copper, and overall weight—a huge advantage on an aircraft where every pound counts. This weight reduction, plus the ability to keep equipment compact and still deliver reliable power to avionics and other systems, is why 400 Hz is used. The frequency is a deliberate trade-off: it reduces the size and weight of the electrical hardware and improves performance for avionics, even though higher frequency brings design challenges like increased losses if not engineered carefully.

5. What kind of maintenance actions might be required after a generator fault?

- A. Inspect generator and bus connections, verify TRU and inverter operation, check fuses/circuit breakers.**
- B. Replace the airplane's engine.**
- C. Adjust landing gear tension.**
- D. Reroute fuel lines.**

When a generator fault occurs, the key is to verify the electrical power path and its components. Start by inspecting the generator itself and its connections to the electrical bus, because loose or corroded connections or a damaged generator could cause loss of output or improper sensing. Next, check the Transformer Rectifier Unit and the inverter because they are essential for converting and supplying power to the DC and AC buses as needed; a fault or failure in the TRU or inverter can leave the aircraft without proper power even if the generator is healthy. Finally, review the fuses and circuit breakers to see if a protective device has tripped; a tripped breaker can mask the underlying fault or indicate the exact faulty circuit that needs attention. Together, these steps get to the heart of how electrical power is generated, converted, and distributed, and they help locate whether the issue is the generator itself, a control/conditioning device, or a protection device. Replacing the engine, adjusting landing gear tension, or rerouting fuel lines do not address the electrical path and are not pertinent to resolving a generator fault.

6. What is the effect of engaging the Essential Power Button on the electrical emergency configuration?

- A. No change to the auto transfer logic.**
- B. Transfers power to non-essential loads.**
- C. Powers all buses from battery sources.**
- D. Overrides auto transfer to electrical emergency configuration and powers only the Essential Buses.**

Engaging the Essential Power Button puts the electrical system into an emergency configuration. In this mode, the normal auto-transfer logic is overridden so that only the essential buses are powered, drawing from the emergency power source. The goal is to conserve power and keep the equipment vital to safe flight energized when normal power sources can't support the entire electrical system. That's why this option best matches the intent: it specifically overrides automatic transfer to protect essential systems, rather than leaving the system unchanged, or energizing non-essential loads, or powering everything from battery.

7. The APU is electrically connected to which DC bus?

- A. Left DC Bus**
- B. Right DC Bus**
- C. The Central DC Bus**
- D. SHED BUSES**

The central DC bus is the point where the APU's electrical power is connected. On the ERJ-145, the APU provides power to this central bus so that essential systems and avionics have a reliable DC source when engine generators aren't online or during start. From the central bus, power can be shared with the left and right DC buses through the bus ties as needed, but the APU's feed is specifically routed to the central bus to establish a common, controllable power source for critical loads. Left and right DC buses are normally driven by their respective engine generators, not directly by the APU, and SHED BUSES aren't the standard APU connection point.

8. With four or five generators online, what is the electrical arrangement?

- A. Two isolated left and right networks with partial energization**
- B. Three separate networks with all buses energized**
- C. Two isolated left and right networks. All buses energized**
- D. A single central bus powering all loads**

With four or five generators online, the electrical system is set up as two independent networks, left and right. Keeping these networks isolated protects against faults on one side affecting the other, while still having enough generator capacity to energize all buses. This means each network can supply power to every bus, so all buses remain energized even as loads are shared and generators come and go. The two-network arrangement provides redundancy and reliability: if one side experiences a fault or loss of generators, the other side can keep the system powered. The other options would either create unnecessary complexity, a single path prone to complete loss of power, or fail to guarantee energizing all buses under peak loading.

9. Which bus supplies power to the inverter?

- A. Ground Service Bus**
- B. DC Bus 1**
- C. AC Bus 2**
- D. Battery Bus**

Inverters need a DC power source to create AC. On this airplane the inverter is fed from DC Bus 1, which provides the 28V DC input the inverter converts to 115V AC for the AC distribution (AC Bus 2). The Ground Service Bus is only used to supply external power on the ground and doesn't feed the inverter during normal operation. The Battery Bus powers essential equipment and can back up DC power, but the inverter's normal DC supply is DC Bus 1, not the Battery Bus.

10. How can you determine that automatic transfer has failed during a total loss of generators?

- A. The cockpit indicators show a fault**
- B. The displays don't lose power**
- C. Emergency lights illuminate**
- D. External power status changes**

When the aircraft experiences a total loss of generators, the automatic transfer system is supposed to switch essential loads to an alternative power source (like the standby or emergency power) so critical instruments keep operating. The most direct, observable way to infer whether that automatic transfer is functioning is by watching the cockpit displays: if they stay illuminated and do not lose power, you can be confident that the power supply to those essential systems has been maintained, meaning the transfer logic is working (or at least that the failure mode isn't causing a loss of display power). If the automatic transfer had failed, those critical displays would be expected to lose power as the power path isn't reconfigured to the backup source. Other indicators—like a fault light in the cockpit, emergency lights behavior, or external power status changes—are less directly diagnostic of the automatic transfer's operation during a generator loss. They can signal issues or changes in power sources, but they don't as reliably indicate whether the automatic transfer function has successfully reconfigured power to the essential systems.

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://erj145electrical.examzify.com>

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

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