

ARRL TECHNICIAN PRACTICE EXAM (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

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THE FULL VERSION STUDY GUIDE**

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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. What antenna polarization is typically used for long-distance weak-signal CW and SSB contacts on VHF and UHF?**
 - A. Vertical
 - B. Horizontal
 - C. Diagonal
 - D. Circular

- 2. What does the term "broadcasting" refer to in the context of FCC rules for amateur services?**
 - A. Transmissions intended for reception by the general public
 - B. Transmissions for private use only
 - C. Emergency communications only
 - D. Signals intended for international stations

- 3. What should you do if your 2 meter signals were strong but now are weak or distorted?**
 - A. Change your frequency
 - B. Shut down the station
 - C. Move or adjust your antenna
 - D. Reboot your equipment

- 4. What is meant by the gain of an antenna?**
 - A. The increase in signal strength in a specified direction when compared to a reference antenna
 - B. The amount of power an antenna can transmit
 - C. The measure of antenna height
 - D. The area covered by the antenna's signal

- 5. What is a primary factor to consider when selecting a coax cable for high-frequency applications?**
 - A. The cable's physical size
 - B. The saturation level
 - C. The loss characteristic at high frequencies
 - D. The color of the outer jacket

- 6. What is a disadvantage of air core coaxial cable when compared to foam or solid dielectric types?**
- A. It requires special techniques to prevent water absorption
 - B. It is more expensive to manufacture
 - C. It has a higher signal loss
 - D. It is more difficult to work with
- 7. What is an appropriate way to call another station on a repeater if you know the other station's call sign?**
- A. Wait for the station to call you
 - B. Say your call sign first
 - C. Say the station's call sign then identify with your call sign
 - D. Transmit a test signal before calling
- 8. Which of the following is a common use of coaxial cable?**
- A. Carrying RF signals between a radio and antenna
 - B. Transmitting data in telephone lines
 - C. Connecting computers to network switches
 - D. Powering remote devices
- 9. What is a fundamental aspect of RF radiation safety in amateur radio?**
- A. All equipment must be operated at maximum capacity
 - B. Operators must be aware of exposure levels
 - C. Only digital equipment can be used
 - D. RF exposure does not need to be monitored
- 10. What is the formula used to calculate electrical power in a DC circuit?**
- A. Power (P) equals current (I) divided by voltage (E)
 - B. Power (P) equals voltage (E) multiplied by current (I)
 - C. Power (P) equals voltage (E) plus current (I)
 - D. Power (P) equals resistance (R) times current (I)

Answers

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

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Explanations

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1. What antenna polarization is typically used for long-distance weak-signal CW and SSB contacts on VHF and UHF?

- A. Vertical
- B. Horizontal**
- C. Diagonal
- D. Circular

The correct answer is horizontal polarization. This type of polarization is particularly advantageous for long-distance weak-signal communications, especially for modes like Continuous Wave (CW) and Single Sideband (SSB) on VHF and UHF bands. Horizontal polarization is preferred in these scenarios because it tends to reduce multipath interference and exploit lower elevation angles, which can enhance the signal's reach and improve overall communication quality. It is especially helpful when making contacts over long distances, where line-of-sight propagation can be interrupted by obstructions, thereby benefiting from a horizontal plane. In the context of the other polarization options, vertical polarization is common in certain applications, especially for local communications, but it may not be as effective over long distances in the same way horizontal polarization can be. Diagonal and circular polarizations are less commonly used for these specific types of weak-signal contacts, with diagonal polarization not fitting established practices for standard communications and circular polarization typically being more relevant in specific applications like satellite communications or specialized setups where the orientation of the receiver and transmitter may vary.

2. What does the term "broadcasting" refer to in the context of FCC rules for amateur services?

- A. Transmissions intended for reception by the general public**
- B. Transmissions for private use only
- C. Emergency communications only
- D. Signals intended for international stations

In the context of FCC rules for amateur services, "broadcasting" specifically refers to transmissions that are intended for reception by the general public. This definition is critical because amateur radio is intended primarily for personal communications, experimentation, and public service rather than broadcasting content to a large audience. When an amateur operator transmits information with the goal of reaching the general populace, they cross into the realm of broadcasting, which is generally not permitted under amateur licenses. The rules emphasize that amateur radio operators should not engage in broadcasting activities as their transmissions should primarily facilitate direct communication with other licensed amateurs, rather than creating content for a broad audience. Thus, the clarity in good practice and regulations asserts that the focus should remain on non-commercial communication and services, making option A the accurate answer. The other options reflect scenarios that do not align with the FCC's definitions regarding amateur radio operations. For example, private use does not encompass broad public broadcasts, while emergency communications are a specific category that doesn't fall under typical broadcasting. International signal transmissions are also regulated differently, thus further clarifying the distinction of amateur operations from broadcasting.

3. What should you do if your 2 meter signals were strong but now are weak or distorted?

- A. Change your frequency
- B. Shut down the station
- C. Move or adjust your antenna**
- D. Reboot your equipment

If your 2 meter signals were previously strong but have now become weak or distorted, adjusting or moving your antenna is a practical first step to address the issue. Antennas are highly sensitive to their physical orientation, location, and environmental factors that can affect performance. Antenna misalignment, obstructions from buildings or trees, or changes in the surrounding environment can cause signal degradation. By repositioning or adjusting the antenna, you can often restore signal strength and clarity, ensuring better communication. While other actions such as changing frequency or rebooting your equipment may sometimes help, they do not directly address the primary cause of signal loss that is often related to antenna positioning and condition. Shutting down the station would not resolve the issue and leads to unnecessary downtime. Therefore, moving or adjusting your antenna is usually the most effective initial action in such a scenario.

4. What is meant by the gain of an antenna?

- A. The increase in signal strength in a specified direction when compared to a reference antenna**
- B. The amount of power an antenna can transmit
- C. The measure of antenna height
- D. The area covered by the antenna's signal

The gain of an antenna refers specifically to the increase in signal strength in a specified direction compared to a reference antenna, typically an isotropic radiator or a dipole antenna. This measure expresses how effectively the antenna can direct radio waves in a particular direction, enhancing the signal strength more than the reference would. Antenna gain is usually expressed in decibels (dB) and indicates the antenna's ability to focus energy in a desired direction, which is crucial for maximizing communication range and quality. A higher gain means that the antenna can send and receive signals more efficiently in certain directions, making it a critical factor in antenna design and selection for various applications like amateur radio, cellular communications, and broadcasting. Other choices do not accurately define antenna gain. The power an antenna can transmit relates more to its input power and efficiency rather than its gain. The height of the antenna and the area covered by its signal are physical attributes and operational characteristics but do not specifically convey the concept of gain. Understanding antenna gain is essential for anyone working with radio frequencies, as it directly affects communication effectiveness.

5. What is a primary factor to consider when selecting a coax cable for high-frequency applications?

- A. The cable's physical size
- B. The saturation level
- C. The loss characteristic at high frequencies**
- D. The color of the outer jacket

When selecting a coax cable for high-frequency applications, the loss characteristic at high frequencies is a primary factor to consider. This is crucial because as frequency increases, the signal loss through the cable can significantly impact performance. Loss is typically measured in decibels per 100 feet (or meter) and is influenced by the materials used in the cable, the cable's construction, and the frequency at which it operates. A cable with low loss characteristics at high frequencies will ensure that the maximum amount of the transmitted signal reaches the destination, thereby maintaining the integrity and quality of the signal. This is especially important in applications such as amateur radio, television broadcasting, and telecommunications, where high signal fidelity is essential. While the physical size of the cable, saturation levels, and outer jacket color may have their importance in specific applications or considerations, they do not have the same direct impact on signal integrity as the loss characteristics at high frequencies. Thus, focusing on minimizing loss is key for effective performance in high-frequency scenarios.

6. What is a disadvantage of air core coaxial cable when compared to foam or solid dielectric types?

- A. It requires special techniques to prevent water absorption**
- B. It is more expensive to manufacture
- C. It has a higher signal loss
- D. It is more difficult to work with

The chosen answer highlights a significant disadvantage of air core coaxial cable: its susceptibility to water absorption, which necessitates special techniques to mitigate this issue. Air core coaxial cable is designed with a dielectric that is primarily air, which can leave it vulnerable to moisture infiltration. When water enters the cable, it can degrade performance by increasing signal attenuation and can lead to the likelihood of damage over time. In contrast, foam or solid dielectric coaxial cables are generally designed to be more resistant to moisture. These materials do not allow for easy water intrusion, which in turn helps maintain signal integrity and overall durability. Therefore, the need for special measures to manage moisture with air core coaxial cable marks its primary disadvantage when compared to foam or solid dielectric options. The other options focus on different facets but do not capture the critical concern of moisture absorption. For example, while air core cables may have different cost dynamics, the mention of expense does not directly correlate with the physical vulnerabilities inherent to the design. Similarly, signal loss characteristics are also a prevalent aspect, but not specifically linked to the moisture issue like the first option. Lastly, difficulty in handling is more a matter of user skill and practice rather than an inherent disadvantage of the air core design itself. Thus,

7. What is an appropriate way to call another station on a repeater if you know the other station's call sign?

- A. Wait for the station to call you
- B. Say your call sign first
- C. Say the station's call sign then identify with your call sign**
- D. Transmit a test signal before calling

When calling another station on a repeater and you know their call sign, the appropriate way to initiate communication is to say the other station's call sign followed by your own call sign. This method is consistent with proper operating procedures in amateur radio. By stating the call sign of the station you wish to contact first, you immediately identify to all users of the repeater that you are trying to reach a specific operator. This is courteous and helps in ensuring clarity in communication, especially in busy or crowded repeater environments. After mentioning the other station's call sign, you then identify yourself, which fulfills the requirement of identifying your own call sign as mandated by FCC regulations. This approach is preferred for establishing a clear contact and represents proper etiquette in amateur radio, facilitating effective communication among operators.

8. Which of the following is a common use of coaxial cable?

- A. Carrying RF signals between a radio and antenna**
- B. Transmitting data in telephone lines
- C. Connecting computers to network switches
- D. Powering remote devices

Coaxial cable is widely used in radio communications, specifically for carrying radio frequency (RF) signals between a radio transceiver and an antenna. This is due to its design, which includes an inner conductor surrounded by a dielectric insulator and an outer conductive shield. This construction provides excellent shielding against external interference and maintains a consistent impedance, which is critical for efficient signal transmission and minimizing loss. Using coaxial cable for RF signals allows for reduced signal degradation over distance compared to other types of cables, making it ideal for applications in amateur radio, television broadcasting, and various communication systems. The ability to effectively transmit and receive signals while minimizing noise is what makes coaxial cable the preferred choice for connecting radios to antennas. The other options refer to different technologies and cable types. For instance, telephone lines typically utilize twisted pair cables rather than coaxial cables for transmitting data. Similarly, connecting computers to network switches often involves Ethernet cables, which also do not employ the coaxial design. Finally, powering remote devices is usually accomplished through specific power cables or networking standards such as Power over Ethernet (PoE), rather than using coaxial cable, which is intended primarily for signal transmission.

9. What is a fundamental aspect of RF radiation safety in amateur radio?

- A. All equipment must be operated at maximum capacity
- B. Operators must be aware of exposure levels**
- C. Only digital equipment can be used
- D. RF exposure does not need to be monitored

Being aware of exposure levels is a fundamental aspect of RF radiation safety in amateur radio because it ensures that operators understand the potential risks associated with radio frequency (RF) radiation. This awareness allows them to take necessary precautions to minimize exposure to themselves and others, especially in situations where RF fields can be strong. Monitoring exposure levels is critical because the quality and type of RF radiation can vary based on frequency, power output, and operational practices. The Federal Communications Commission (FCC) and the American National Standards Institute (ANSI) set regulations and guidelines regarding safe exposure limits for RF radiation. It is the operator's responsibility to be informed about these limits and to evaluate their operating practices, antenna placements, and the potential for exposure to themselves and nearby individuals. This fundamental aspect helps to promote safety, ensuring that as operators communicate and experiment with their amateur radio equipment, they do so responsibly and within safe exposure limits.

10. What is the formula used to calculate electrical power in a DC circuit?

- A. Power (P) equals current (I) divided by voltage (E)
- B. Power (P) equals voltage (E) multiplied by current (I)**
- C. Power (P) equals voltage (E) plus current (I)
- D. Power (P) equals resistance (R) times current (I)

The formula that accurately represents the calculation of electrical power in a DC circuit is given by Power (P) equals voltage (E) multiplied by current (I). This relationship is grounded in Ohm's law, which establishes that the power consumed in an electrical circuit is the product of the voltage across the circuit and the current flowing through it. In mathematical terms, the equation is expressed as $P = E \times I$, where P is power measured in watts, E is voltage in volts, and I is current in amperes. This formula is fundamental in electrical engineering and is routinely used to determine how much power a device or a circuit will consume or require. The other options do not reflect the correct relationship for calculating power. The formula involving resistance times current misrepresents power as resistance does not directly correlate to energy consumed; instead, it relates to Ohm's law ($V = I \times R$). The division of current by voltage does not yield power either, and the sum of current and voltage does not provide any meaningful calculation in this context. Thus, the multiplication of voltage and current is essential to correctly ascertain the power in a DC circuit.

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://arrltechnician.examzify.com>

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

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