HAM RADIO GENERAL CLASS 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. **What is the capacitance of three 100 microfarad capacitors connected in series?**

   A. 0.30 microfarads

   B. 0.33 microfarads

   C. 33.3 microfarads

   D. 300 microfarads

2. **What happens when the feed point of a quad antenna is changed from the center of either horizontal wire to the center of either vertical wire?**

   A. The polarization of the radiated signal changes from horizontal to vertical

   B. The polarization of the radiated signal changes from vertical to horizontal

   C. The direction of the main lobe is reversed

   D. The radiated signal changes to an omnidirectional pattern

3. **When is an amateur station permitted to transmit secret codes?**

   A. During a declared communications emergency

   B. To control a space station

   C. When information is of a routine nature

   D. With Special Temporary Authorization from the FCC

4. **How can you determine that your station complies with FCC RF exposure regulations?**

   A. By calculation based on FCC OET Bulletin 65

   B. By calculation based on computer modeling

   C. By measurement of field strength using calibrated equipment

   D. All of these choices are correct

5. **Which circuit is used to combine signals from the carrier oscillator and speech amplifier and send the result to the filter in a typical single-sideband phone transmitter?**

   A. Discriminator

   B. Detector

   C. IF amplifier

   D. Balanced modulator

6. In a log periodic antenna, how does the spacing of the elements change?

A. Constant spacing across all elements

B. Increases or decreases linearly

C. Varies sinusoidally

D. Increases logarithmically along the boom

7. What is one disadvantage of using a shortened mobile antenna as opposed to a full size antenna?

A. Short antennas are more likely to cause distortion of transmitted signals

B. Short antennas can only receive vertically polarized signals

C. Operating bandwidth may be very limited

D. Harmonic radiation may increase

8. Which of the following is one effect of lead inductance in a capacitor used at VHF and above?

A. Effective capacitance may be reduced

B. Voltage rating may be reduced

C. ESR may be reduced

D. The polarity of the capacitor might become reversed

9. What is the minimum wire size that may be safely used for a circuit that draws up to 20 amperes of continuous current?

A. AWG number 20

B. AWG number 16

C. AWG number 12

D. AWG number 8

10. Why is it best NOT to draw the DC power for a 100-watt HF transceiver from an automobile's auxiliary power socket?

A. The socket is not wired with an RF-shielded power cable

B. The socket's wiring may be inadequate for the current being drawn by the transceiver

C. The DC polarity of the socket is reversed from the polarity of modern HF transceivers

D. Drawing more than 50 watts from this socket could cause the engine to overheat

Answers

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

Explanations

1. What is the capacitance of three 100 microfarad capacitors connected in series?

A. 0.30 microfarads

B. 0.33 microfarads

C. 33.3 microfarads

D. 300 microfarads

When capacitors are connected in series, the total capacitance can be calculated using the formula: \[\frac{1}{C_{total}} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} \] In this case, all three capacitors have the same capacitance of 100 microfarads. Plugging the values into the formula gives: \[\frac{1}{C_{total}} = \frac{1}{100 \mu F} + \frac{1}{100 \mu F} + \frac{1}{100 \mu F} = \frac{1}{100} + \frac{1}{100} + \frac{1}{100} = \frac{3}{100} \] Therefore, to find the total capacitance, you take the reciprocal of \(\frac{3}{100}\): \[C_{total} = \frac{100}{3} \mu F \approx 33.33 \mu F \] This calculation confirms that the capacitance of three 100 microfarad capacitors connected in series is approximately 33.3 microfarads,

2. What happens when the feed point of a quad antenna is changed from the center of either horizontal wire to the center of either vertical wire?

A. The polarization of the radiated signal changes from horizontal to vertical

B. The polarization of the radiated signal changes from vertical to horizontal

C. The direction of the main lobe is reversed

D. The radiated signal changes to an omnidirectional pattern

When the feed point of a quad antenna is moved from the center of either horizontal wire to the center of either vertical wire, the polarization of the radiated signal changes from horizontal to vertical. In a quad antenna, the orientation of the elements plays a crucial role in determining the polarization of the emitted radio waves. When you feed the antenna at a horizontal element, the polarization is horizontal, meaning the electric field of the radiated signal oscillates in a horizontal plane relative to the ground. Conversely, when feeding the antenna at a vertical element, the emitted signal's electric field oscillates vertically, which means the polarization is vertical. This fundamental principle of antenna design explains the behavior of the antenna under the specified changes in the feed point, and it's important for operators to understand the implications of polarization when designing their setups for effective communication.

3. When is an amateur station permitted to transmit secret codes?

A. During a declared communications emergency

B. To control a space station

C. When information is of a routine nature

D. With Special Temporary Authorization from the FCC

The most suitable situation where an amateur station is permitted to transmit secret codes is when controlling a space station. In this context, the use of codes may be necessary for efficient communication regarding the technical aspects of space operations, where certain information might not be suitable for public dissemination due to operational security or safety concerns. Amateur radio operators are usually restricted from using coded messages that conceal the meaning of the communication, as this goes against the principles of open communication among licensed amateur operators. Therefore, using codes solely for operational control of space-related communications aligns with permitted practices under amateur radio rules, where the objective is ensuring safe and effective interactions in a specialized context. The other scenarios do not fulfill the criteria set forth by amateur radio regulations. For example, during a declared communications emergency or for routine information, the use of secret codes would not be appropriate because it is essential to maintain transparency and clarity in communications, particularly in emergency situations. Additionally, while Special Temporary Authorization from the FCC could allow for various operations outside normal regulations, it does not specifically grant the right to use secret codes. Therefore, controlling a space station is the only option that allows for this under amateur radio rules.

4. How can you determine that your station complies with FCC RF exposure regulations?

A. By calculation based on FCC OET Bulletin 65

B. By calculation based on computer modeling

C. By measurement of field strength using calibrated equipment

D. All of these choices are correct

To determine compliance with FCC RF exposure regulations, it is essential to recognize the different methods available, as each option contributes to a comprehensive assessment. Calculation based on FCC OET Bulletin 65 provides a framework for evaluating exposure levels. This bulletin outlines specific formulas and methodologies to analyze how much RF energy is emitted and how that energy can affect human exposure. Additionally, calculation based on computer modeling offers an advanced technique to simulate RF fields in various scenarios. This approach allows for predictions of RF exposure without needing physical measurements, helping operators visualize exposure risks based on system design and expected operation conditions. Lastly, measuring field strength using calibrated equipment provides a direct approach to quantifying the RF levels around the station. By using precision tools, operators can assess the actual exposure levels in the environment, ensuring that they remain within safe limits. Since each method—calculative analysis, computer modeling, and practical measurements—is valid and useful for confirming compliance, leveraging all these approaches ensures a thorough understanding of RF exposure, leading to appropriate operational practices according to FCC regulations.

5. Which circuit is used to combine signals from the carrier oscillator and speech amplifier and send the result to the filter in a typical single-sideband phone transmitter?

A. Discriminator

B. Detector

C. IF amplifier

D. Balanced modulator

In a typical single-sideband (SSB) phone transmitter, a balanced modulator plays a crucial role in combining the signals from the carrier oscillator and the speech amplifier. The balanced modulator takes the audio signal (from the speech amplifier) and the carrier wave (from the carrier oscillator) and combines them to produce a modulated output. This process effectively shifts the audio signal into the radio frequency (RF) spectrum for transmission. The balanced modulator works by ensuring that the carrier signal is suppressed while the information (audio) is modulated onto the signal. This is key to SSB transmission, as it only transmits one sideband (either upper or lower) of the modulated signal, significantly improving bandwidth efficiency and reducing power usage compared to traditional amplitude modulation (AM). Other circuit types serve different functions. For instance, a discriminator is typically used in the receiver's process of demodulating frequency-modulated signals, while a detector is similarly used for demodulating AM signals. The IF amplifier amplifies intermediate frequency signals in superheterodyne receivers but does not combine the carrier and audio signals. Hence, the balanced modulator is the appropriate circuit for this application in SSB transmission.

6. In a log periodic antenna, how does the spacing of the elements change?

A. Constant spacing across all elements

B. Increases or decreases linearly

C. Varies sinusoidally

D. Increases logarithmically along the boom

In a log periodic antenna, the spacing between the elements increases logarithmically along the boom. This design allows the antenna to operate effectively over a wide range of frequencies. The log periodic structure consists of a series of dipole elements that are progressively longer and spaced more widely as one moves along the boom. The logarithmic spacing is critical because it allows the antenna to maintain a consistent impedance across its operating bandwidth. As frequencies increase, the resonance of each element aligns with the transmission or receiving frequencies closely related to their length and spacing, which contributes to the antenna's ability to perform well over a broad spectrum. Other options do not accurately describe how the spacing changes in a log periodic antenna. Constant spacing would not provide the necessary impedance matching across frequencies, while linear or sinusoidal variations do not reflect the specific growth pattern that characterizes log periodic designs. The logarithmic increase is essential for achieving the intended performance and frequency capabilities of this type of antenna.

7. What is one disadvantage of using a shortened mobile antenna as opposed to a full size antenna?

A. Short antennas are more likely to cause distortion of transmitted signals

B. Short antennas can only receive vertically polarized signals

C. Operating bandwidth may be very limited

D. Harmonic radiation may increase

A shortened mobile antenna is designed to be more compact and portable compared to a full-size antenna, which can be advantageous for mobile operations. However, one notable disadvantage is that the operating bandwidth may be very limited. This limitation arises because the physical size of the antenna affects its resonance and efficiency. Full-size antennas are typically able to cover a wider range of frequencies effectively due to their length, which allows them to resonate better. In contrast, shortened antennas often need to be tuned to specific frequencies, and they may only perform well over a narrow band. This means that operators using a shortened antenna might experience difficulties when attempting to transmit over frequencies outside that specified range, which can restrict operational flexibility and effectiveness. The other options address different factors related to antenna performance but do not directly correlate with the fundamental issues that result from the shortened length of the antenna impacting its bandwidth capabilities.

8. Which of the following is one effect of lead inductance in a capacitor used at VHF and above?

A. Effective capacitance may be reduced

B. Voltage rating may be reduced

C. ESR may be reduced

D. The polarity of the capacitor might become reversed

Lead inductance in capacitors, especially when used at VHF (Very High Frequency) and above, can have a significant effect on the effective capacitance. At these frequencies, the inductance associated with the leads can create a condition where the overall circuit behaves as if it has reduced capacitance—this is due to the resonant effects of the inductor (the leads) and capacitor (the capacitor itself) when combined in a high-frequency environment. As frequency increases, the impedance of the inductive lead tends to increase, which can lead to a situation where less effective capacitance is realized in the circuit. Thus, the contribution of inductance can dominate over the intended capacitance, especially if the capacitor is not designed with this in mind—resulting in degraded performance at high frequencies. In contrast, the other options involve misunderstandings of the effects of lead inductance. The voltage rating typically remains unchanged as it is more a function of the capacitor's construction and dielectric material rather than inductance. The equivalent series resistance (ESR) is influenced by factors such as the quality of materials and design rather than lead inductance alone. Lastly, the polarity of a capacitor does not change due to lead inductance; it is dictated by the

9. What is the minimum wire size that may be safely used for a circuit that draws up to 20 amperes of continuous current?

A. AWG number 20

B. AWG number 16

C. AWG number 12

D. AWG number 8

The minimum wire size that may be safely used for a circuit drawing up to 20 amperes of continuous current is AWG number 12. This wire gauge is commonly recommended because it can adequately handle the current without excessive voltage drop or overheating over longer distances. The American Wire Gauge (AWG) system provides a standardized method for specifying wire sizes, where a lower gauge number indicates a thicker wire capable of carrying more current. For a circuit that draws 20 amperes, it is crucial to consider both the continuous current rating and the wire's ability to dissipate heat effectively. AWG number 12 has a safe continuous current capacity of approximately 20 amperes, making it suitable for general household wiring and similar applications. Sizing up ensures safety and efficiency, as using a wire gauge that is too small for the current can lead to overheating and potentially create a fire hazard. Other wire gauges listed in the options, like AWG numbers 20 and 16, are not adequate for sustained use at 20 amperes, as they would exceed their current-carrying capacity and risk overheating. AWG number 8, while capable of handling much more current, is unnecessarily thick for this specific application and would be more than what is required

10. Why is it best NOT to draw the DC power for a 100-watt HF transceiver from an automobile's auxiliary power socket?

A. The socket is not wired with an RF-shielded power cable

B. The socket's wiring may be inadequate for the current being drawn by the transceiver

C. The DC polarity of the socket is reversed from the polarity of modern HF transceivers

D. Drawing more than 50 watts from this socket could cause the engine to overheat

Drawing DC power for a 100-watt HF transceiver from an automobile's auxiliary power socket is best avoided primarily because the socket's wiring may be inadequate for the current being drawn by the transceiver. Automobile auxiliary power sockets are typically designed for low-current loads, like powering small electronic devices or charging smartphones. They are often wired with lighter gauge wire, which may not be capable of safely carrying the high current that a 100-watt transceiver requires. When a transceiver operates at 100 watts, the current draw can exceed 8 amps at 12 volts. If the wiring is not sufficient to handle this current, it can lead to overheating, voltage drops, or even damage to the vehicle's electrical system. Ensuring that the power supply is adequate for the load is crucial for safe and optimal operation of the equipment. While the other options may present potential issues, the inadequate wiring is the primary concern when attempting to draw a significant amount of power from an auxiliary socket in a vehicle.

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:

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