O-STRAND RADAR 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.

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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!

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Questions

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1. Which two numbers represent the mode tests run by the fire control digital computer during test node?

A. 12 and 34

B. 24 and 46

C. 23 and 46

D. 46 and 23

2. How does phase-shifter-based electronic scanning enable rapid beam steering?

A. By moving the antenna mechanically to sweep the beam.

B. By time-sharing the transmitter power across elements.

C. By adjusting phase delays across array elements, the constructive interference steers the main beam without moving the antenna.

D. By demodulating the received signal at multiple frequencies.

3. Tracking RADAR is also known as which RADAR type?

A. Fire-Control RADAR

B. Approach RADAR

C. Airborne RADAR

D. Missile RADAR

4. Which of the following is NOT listed as a function of Airborne RADAR?

A. Weather Surveillance

B. Navigation

C. Missile Control

D. Ground Mapping

5. In a monostatic radar, transmitter and receiver share the same antenna; the range equation gains simplify to what?

A. The gain terms cancel to zero; $P_r \approx \ldots$

B. The gains add linearly; $P_r \approx \ldots$

C. The transmitter and receiver share the same antenna so $G_t = G_r$ and $L_t = L_r$, giving $P_r \approx (P_t G^2 \lambda^2 \sigma)/((4\pi)^3 R^4 L^2)$

D. The gains become external; $P_r \approx (P_t G_t G_r \lambda^3 \sigma)/\ldots$

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6. Which unit outputs the required display by processing signals from other radar units and aircraft systems?

A. Display Unit

B. Processor

C. Indicator

D. Receiver

7. Which term describes reducing the gain of selective IF amplifier stages for large target returns?

A. FTC

B. COAC

C. AGC

D. Limiter

8. What is the operational characteristic of a pulse Doppler radar system?

A. It detects only velocity

B. It tracks on a velocity basis

C. It detects and tracks on a velocity basis

D. It detects and tracks on a range basis

9. What is Moving Target Indicator (MTI) and how does it suppress stationary clutter?

A. MTI uses amplitude thresholding to suppress high-power stationary returns.

B. MTI uses Doppler-based filtering to suppress zero or near-zero Doppler; preserve moving targets.

C. MTI uses spatial filtering to suppress clutter using antenna nulling.

D. MTI uses time gating to remove stationary targets.

10. Which card produces pulses that are 50 ns wide?

A. Sweep Generator card

B. Master Trigger Generator card

C. Range Gate card

D. Pulse Shaper card

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Answers

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

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Explanations

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1. Which two numbers represent the mode tests run by the fire control digital computer during test node?

A. 12 and 34

B. 24 and 46

C. 23 and 46

D. 46 and 23

During test node, the fire control digital computer uses predefined diagnostic modes, each identified by a code, to verify its subsystems. The test protocol specifies a particular pair of these codes that must be run together in this node. Following that exact pair ensures the intended checks happen in the correct sequence, validating the relevant logic and data paths as designed. The order matters because the diagnostic flow is arranged so the first mode test establishes the system state for the second; swapping them would not match the documented test sequence and could miss or misinterpret faults. Other pairings don't fit the required protocol, since they either propose a different combination or a different order, which isn't the sequence defined for this node's diagnostic routine.

2. How does phase-shifter-based electronic scanning enable rapid beam steering?

A. By moving the antenna mechanically to sweep the beam.

B. By time-sharing the transmitter power across elements.

C. By adjusting phase delays across array elements, the constructive interference steers the main beam without moving the antenna.

D. By demodulating the received signal at multiple frequencies.

Phase-shifter-based electronic scanning steers the radar beam by controlling the phase of the signal at each element of a antenna array. By applying a specific set of phase delays across the elements, the radiated waves interfere constructively in a chosen direction and destructively elsewhere, creating a main beam that points where you want. This phase progression effectively "tilts" the array's radiation pattern without moving any hardware. Because there are no mechanical parts to move, changing the beam direction is just updating the phase settings, which can be done in microseconds or faster. This enables truly rapid beam steering and the ability to switch directions quickly or even form multiple beams. Moving the antenna would be mechanical steering, which is slower and subject to wear and inertia. Time-sharing transmitter power across elements isn't about steering the beam, and demodulating the received signal at multiple frequencies deals with signal processing, not directing where the beam is pointed.

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3. Tracking RADAR is also known as which RADAR type?

A. Fire-Control RADAR

B. Approach RADAR

C. Airborne RADAR

D. Missile RADAR

Tracking radar is the function that keeps a precise lock on a moving target to feed continuous position and motion data for weapon guidance. This continuous tracking is a core part of fire-control radars, which are designed specifically to aim and guide guns or missiles. They compute the interception parameters and provide real-time updates to steer the weapon toward the target, which is why tracking radar is also known as fire-control radar. Approach radar is used for guiding aircraft during landing, not for weapon guidance. Airborne radar describes radar systems mounted on aircraft for detecting and tracking targets, but not the dedicated tracking and fire-control role. Missile radar would refer to radar on missiles or seeker systems, which serve different guidance needs than a ground- or ship-based fire-control radar that maintains the target track for firing.

4. Which of the following is NOT listed as a function of Airborne RADAR?

A. Weather Surveillance

B. Navigation

C. Missile Control

D. Ground Mapping

Airborne radar is used to support flight and mission tasks by giving the crew navigation information, targeting data for weapons, and imagery of the ground. Navigation helps determine position and course relative to features on the map or terrain. Missile control involves tracking a target and providing data to guide a weapon. Ground mapping produces radar imagery of the terrain for reconnaissance or planning. Weather surveillance, while important for flight safety, is typically handled by a separate meteorological radar system rather than the standard airborne radar functions described here. That's why weather surveillance isn't listed as a function of the airborne radar in this context.

5. In a monostatic radar, transmitter and receiver share the same antenna; the range equation gains simplify to what?

A. The gain terms cancel to zero; $P_r \approx \ldots$

B. The gains add linearly; $P_r \approx \ldots$

C. The transmitter and receiver share the same antenna so $G_t = G_r$ and $L_t = L_r$, giving $P_r \approx (P_t G^2 \lambda^2 \sigma)/((4\pi)^3 R^4 L^2)$

D. The gains become external; $P_r \approx (P_t G_t G_r \lambda^3 \sigma)/\ldots$

In a monostatic radar, the same antenna handles both transmitting and receiving, so the transmitter and receiver gains are the same and must be multiplied together. That gives $G_t G_r = G^2$. Because the signal travels to the target and back, the geometric spreading is effectively squared, giving a $1/R^4$ dependence for range. The receiving aperture relates to the wavelength by $A_e = G \lambda^2 /(4\pi)$, which introduces a λ^2 factor into the received power. Including the two path losses, one on transmit and one on receive, yields the L^2 term in the denominator. Putting these pieces together, the received power is $P_r \approx (P_t G^2 \lambda^2 \sigma) / ((4\pi)^3 R^4 L^2)$. This is exactly the form shown in the correct option. The other forms mis-handle the gain combination, the range dependence, or the λ term.

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6. Which unit outputs the required display by processing signals from other radar units and aircraft systems?

A. Display Unit

B. Processor

C. Indicator

D. Receiver

The display indicator is the device that turns processed radar information into something you can read. Signals from multiple radar units and aircraft systems are collected and processed to extract usable information like range, bearing, and targets. The indicator then takes that processed data and renders the required visual display on the screen you watch. In other words, it's the final output stage that presents the processed data in a format the operator can interpret. The receiver handles incoming signals, the processor performs the analysis, and the display unit/indicator shows the result; the indicator is the element that outputs the actual display.

7. Which term describes reducing the gain of selective IF amplifier stages for large target returns?

A. FTC

B. COAC

C. AGC

D. Limiter

The idea being tested is how a radar receiver keeps strong echoes from overwhelming the IF stages. When a target returns a very large signal, you want the circuit to back off its gain so the later stages don't saturate and distort the measurement. COAC describes this approach: reducing the gain specifically in the selective IF amplifier stages as the input grows. This keeps the output in a usable, roughly linear range, which helps preserve visibility of weak targets while preventing overload from strong ones. Think of it as a targeted automatic gain control for the IF path. It contrasts with a limiter, which would clip the signal and distort the waveform; with a broad automatic gain control that might reduce gain more globally; and with the fast/slow time constants, which merely describe how quickly the control responds rather than the fundamental action of lowering gain. By focusing the gain reduction on the IF stages, COAC provides a balanced way to handle wide variations in target strength.

8. What is the operational characteristic of a pulse Doppler radar system?

A. It detects only velocity

B. It tracks on a velocity basis

C. It detects and tracks on a velocity basis

D. It detects and tracks on a range basis

Pulse Doppler radar hinges on Doppler shift to measure target velocity, while the pulse timing provides range. This combination lets the system not only detect targets but also form and maintain tracks primarily using velocity information. The Doppler measurements create a velocity history that defines the track, and clutter can be suppressed by focusing on moving targets with nonzero Doppler shifts. Range data still comes from the time delay of the returned pulse, but the tracking process itself is driven by velocity information rather than range alone. That's why the best description is that it detects and tracks on a velocity basis.

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9. What is Moving Target Indicator (MTI) and how does it suppress stationary clutter?

A. MTI uses amplitude thresholding to suppress high-power stationary returns.

B. MTI uses Doppler-based filtering to suppress zero or near-zero Doppler; preserve moving targets.

C. MTI uses spatial filtering to suppress clutter using antenna nulling.

D. MTI uses time gating to remove stationary targets.

MTI relies on Doppler processing to separate moving targets from stationary clutter. By looking at successive radar returns over time, stationary clutter stays at zero Doppler (no change in frequency due to motion), while moving targets introduce a Doppler shift proportional to their radial velocity. MTI systems apply a high-pass filter in the Doppler domain (often through temporal differencing or similar Doppler processing), which removes the zero- or near-zero Doppler components associated with stationary clutter. That leaves targets with nonzero Doppler to be detected, so moving targets are preserved and clutter is suppressed. Amplitude-based suppression can reduce strong stationary returns but doesn't inherently distinguish motion, so it isn't the basis of MTI. Spatial filtering via antenna nulling and time gating address different aspects (beam shape or timing) and don't implement the Doppler-based stationary clutter suppression that MTI uses.

10. Which card produces pulses that are 50 ns wide?

A. Sweep Generator card

B. Master Trigger Generator card

C. Range Gate card

D. Pulse Shaper card

In radar timing, syncing all modules hinges on a pulse with a precisely defined width. The Master Trigger Generator is built to output a master timing pulse with fixed, known dimensions, such as 50 nanoseconds, so every subsystem can synchronize to the same event. The Sweep Generator creates a signal that changes over time to drive displays or measurement sweeps, not a fixed-width trigger for coordination. The Range Gate controls when the receiver is active within a chosen range window, focusing on gating rather than delivering a standard trigger pulse. The Pulse Shaper adjusts the shape of a pulse but doesn't inherently provide a fixed, nanosecond-scale width used for global synchronization. So, the card that provides a 50 ns wide pulse is the Master Trigger Generator.

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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!

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