

# NCTI Service Technician Practice Exam (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. For an eight-way feed-through tap at 550 MHz, what would be the input port RF signal level if the preceding tap's level is 35.0 dBmV and the cable loss is 2.2 dB?**
  - A. 33.0 dBmV**
  - B. 32.8 dBmV**
  - C. 31.0 dBmV**
  - D. 35.2 dBmV**
- 2. In a drop system, where can signal leakage be isolated?**
  - A. Only at the ground block**
  - B. At the service drop only**
  - C. At several locations including the ground block and individual drop outlets**
  - D. At the tap location only**
- 3. What is the formula for converting RMS current to peak-to-peak current in an AC waveform?**
  - A. RMS current × 2**
  - B. RMS current × 0.866**
  - C. RMS current × 1.414**
  - D. RMS current × 0.707**
- 4. What does a male BNC-to-F female adapter connect to?**
  - A. Male BNC output connector**
  - B. Female BNC output connector**
  - C. Flush-mount male F-connector**
  - D. Coaxial jumper**
- 5. What is the recommended practice for handling heat dissipation in amplifiers?**
  - A. Increase amplifier size dramatically**
  - B. Ensure proper ventilation around the equipment**
  - C. Run all tests at maximum power**
  - D. Use heat sinks of any size**

**6. What can happen if the fiber-optic cable is pulled with excessive tension?**

- A. It may enhance the signal quality**
- B. It could fracture the optical fibers**
- C. It allows for easier installation**
- D. It typically has no effect on the fiber**

**7. In a step-up transformer, how does the secondary coil voltage compare to the primary coil voltage?**

- A. The secondary voltage is smaller**
- B. They are equal**
- C. The secondary voltage is larger**
- D. The secondary voltage is negative**

**8. What was the incident involving broadband cable signal leakage in Harrisburg known for?**

- A. Disruption of internet service in a city**
- B. Interference with aircraft communications and navigation**
- C. Damage to cable systems in the area**
- D. Regulatory fines imposed on cable operators**

**9. What is a key difference in the design levels of forward and return distribution amplifiers?**

- A. Input levels of forward amplifiers are uniform**
- B. Output levels of all amplifiers should be the same in return amplifiers**
- C. All amplifiers operate on the same frequency**
- D. Return amplifiers can handle more channels**

**10. Above what frequency are feed-thru connectors not typically recommended?**

- A. 100 MHz**
- B. 300 MHz**
- C. 550 MHz**
- D. 1000 MHz**

## **Answers**

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

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## **Explanations**

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**1. For an eight-way feed-through tap at 550 MHz, what would be the input port RF signal level if the preceding tap's level is 35.0 dBmV and the cable loss is 2.2 dB?**

- A. 33.0 dBmV
- B. 32.8 dBmV**
- C. 31.0 dBmV
- D. 35.2 dBmV

To determine the input port RF signal level for the eight-way feed-through tap, we start with the signal level received from the preceding tap and account for both the attenuation of the tap itself and the cable loss. In this case, the preceding tap's signal level is given as 35.0 dBmV, and the cable loss is specified as 2.2 dB. A feed-through tap typically introduces additional tap loss. For an eight-way tap, the theoretical loss due to splitting the signal eight ways is approximately 9 dB. This is because each time the signal is split, theoretically, the power is divided equally among the outputs. To calculate the input port level at the tap, the losses need to be subtracted from the incoming signal level: 1. Start with the incoming signal level: 35.0 dBmV. 2. Subtract the cable loss:  $35.0 \text{ dBmV} - 2.2 \text{ dB} = 32.8 \text{ dBmV}$ . 3. Next, account for the split loss of the tap:  $32.8 \text{ dBmV} - 9 \text{ dB} = 23.8 \text{ dBmV}$ . However, it's critical to note that if looking for the input level

**2. In a drop system, where can signal leakage be isolated?**

- A. Only at the ground block
- B. At the service drop only
- C. At several locations including the ground block and individual drop outlets**
- D. At the tap location only

In a drop system, signal leakage can often be isolated at multiple points within the system, integrating different components where issues may arise. The correct answer reflects that leakage can indeed be addressed at several locations, including the ground block, which serves as a primary termination point for incoming signals and helps manage various frequencies. Additionally, individual drop outlets are points where the signal branches off to specific customer locations, making them potential areas for leakage due to connection points or cabling issues. Understanding this is important because signal integrity is critical in maintaining the quality of service provided, and identifying all possible points of leakage supports effective troubleshooting and maintenance practices. By isolating issues at various points in the system, technicians can better diagnose and resolve any signal degradation problems, ensuring that the overall performance of the network remains stable and reliable.

### 3. What is the formula for converting RMS current to peak-to-peak current in an AC waveform?

- A. RMS current  $\times$  2
- B. RMS current  $\times$  0.866
- C. RMS current  $\times$  1.414**
- D. RMS current  $\times$  0.707

To convert RMS (Root Mean Square) current to peak current in an AC waveform, you use the formula that relates these two values. The relationship is defined by the fact that for a sinusoidal waveform, the peak current is approximately 1.414 times the RMS current. This factor, 1.414, is derived from the square root of 2, which is a key aspect of sinusoidal waveforms. When you calculate peak-to-peak current, it is important to realize that this is twice the peak current. Therefore, the conversion from RMS to peak-to-peak would involve multiplying the RMS current by 1.414 and then doubling that result. However, in the context of this question, the focus is on the conversion from RMS to the peak value itself. Understanding this formula is critical for service technicians working with AC circuits, as it allows for appropriate calculations regarding current and voltage levels in electrical systems, ensuring safe and effective operation of electrical equipment.

### 4. What does a male BNC-to-F female adapter connect to?

- A. Male BNC output connector**
- B. Female BNC output connector
- C. Flush-mount male F-connector
- D. Coaxial jumper

The male BNC-to-F female adapter is specifically designed to connect a male BNC output connector to a female F connector. The primary purpose of any adapter is to bridge two different types of connectors, allowing for compatibility between devices or cables that might not otherwise connect directly. In this case, the male BNC connector has a protruding pin that fits into the recessed socket of the female BNC connector, while the F connector is typically used for coaxial cables. A male BNC output connector will fit directly into the female side of the adapter, creating a secure connection that can facilitate the transfer of signals, such as video or audio feeds from one piece of equipment to another. While other options may seem plausible, they do not accurately describe the specific connection type this adapter is designed for. Understanding the characteristics of these connectors can help you effectively utilize this equipment in various applications involving coaxial cable and RF signals.

## 5. What is the recommended practice for handling heat dissipation in amplifiers?

- A. Increase amplifier size dramatically
- B. Ensure proper ventilation around the equipment**
- C. Run all tests at maximum power
- D. Use heat sinks of any size

Ensuring proper ventilation around the equipment is essential for managing heat dissipation in amplifiers. Amplifiers generate heat during operation, and adequate ventilation helps dissipate that heat effectively, maintaining optimal operating temperatures. Proper airflow around the components can prevent overheating, which can lead to reduced performance, potential damage, or failure of the amplifier over time. In contrast, increasing the size of the amplifier may seem like a straightforward way to manage heat, but it does not directly address heat dissipation or airflow. Running tests at maximum power can increase the risk of overheating, as sustained high power outputs generate more heat without adequate measures in place to dissipate it. Lastly, while using heat sinks can effectively manage heat, the size and design of the heat sinks must be appropriate for the specific application; using any size indiscriminately does not ensure adequate cooling.

## 6. What can happen if the fiber-optic cable is pulled with excessive tension?

- A. It may enhance the signal quality
- B. It could fracture the optical fibers**
- C. It allows for easier installation
- D. It typically has no effect on the fiber

When fiber-optic cable is pulled with excessive tension, it can lead to fractures in the optical fibers. Fiber-optic cables are designed to transmit light signals efficiently, but they are also delicate. The optical fibers within the cable are made of glass or plastic, which can be sensitive to stress and strain. When excessive tension is applied, the fibers may stretch beyond their limits, leading to micro-cracks or complete breaks. This damages the cable and can severely degrade or cut off the light signal being transmitted, resulting in communication failures. In contrast, the other choices do not reflect the reality of how fiber-optic cables behave under excessive tension. Enhancing signal quality, easing installation, or having no effect at all is not possible when the integrity of the fibers is compromised. Understanding the physical limitations of fiber-optic cables is crucial for technicians to ensure proper handling and installation, maintaining optimal performance of the network.

**7. In a step-up transformer, how does the secondary coil voltage compare to the primary coil voltage?**

- A. The secondary voltage is smaller**
- B. They are equal**
- C. The secondary voltage is larger**
- D. The secondary voltage is negative**

In a step-up transformer, the fundamental principle at work is electromagnetic induction, where the primary coil, when energized, creates a magnetic field that induces a voltage in the secondary coil. The design of a step-up transformer incorporates a greater number of turns of wire in the secondary coil compared to the primary coil. As a result of this configuration, the voltage in the secondary coil becomes larger than the voltage in the primary coil. The relationship between the voltages and the number of turns in the coils is given by the formula: 
$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$
 Where  $(V_s)$  is the secondary voltage,  $(V_p)$  is the primary voltage,  $(N_s)$  is the number of turns in the secondary coil, and  $(N_p)$  is the number of turns in the primary coil. Since  $(N_s)$  is greater than  $(N_p)$  in a step-up transformer, it follows that  $(V_s)$  will be larger than  $(V_p)$ . This transformation of voltage is crucial in applications where higher voltages are needed for efficient power transmission over long distances, minimizing energy loss due to resistance. Thus, in the context of how the secondary coil voltage compares to

**8. What was the incident involving broadband cable signal leakage in Harrisburg known for?**

- A. Disruption of internet service in a city**
- B. Interference with aircraft communications and navigation**
- C. Damage to cable systems in the area**
- D. Regulatory fines imposed on cable operators**

The incident involving broadband cable signal leakage in Harrisburg is primarily known for its interference with aircraft communications and navigation. Signal leakage occurs when broadband signals are not properly contained within coaxial cables, leading to the potential for these signals to interfere with other critical communication systems, particularly those used by aircraft. Due to the sensitive nature of aviation communications, any interference can pose significant safety risks. In this case, the leakage raised alarms about the integrity of air traffic control and pilot communications, prompting immediate investigations and actions to mitigate the problem. This highlights the importance of maintaining strict standards for cable systems' performance to ensure public safety and the proper functioning of all necessary communication networks. While disruptions to internet service, damage to local cable systems, and regulatory fines may also be relevant to such incidents, the most critical concern was the potential hazards posed to aviation safety, making it a notable case in the discussion of broadband signal management and regulation.

## 9. What is a key difference in the design levels of forward and return distribution amplifiers?

- A. Input levels of forward amplifiers are uniform
- B. Output levels of all amplifiers should be the same in return amplifiers**
- C. All amplifiers operate on the same frequency
- D. Return amplifiers can handle more channels

The key difference in the design levels of forward and return distribution amplifiers lies in how the output levels are managed. In return amplifiers, it's crucial that output levels are consistent across all amplifiers to ensure proper signal strength and integrity throughout the network. This uniformity is essential for maintaining a strong and reliable return path for upstream signals, which are often aggregated from multiple sources before being sent back to the headend. Forward amplifiers, on the other hand, typically deal with signals flowing outward to the end user. They may accommodate varying input levels depending on the demands of the individual services being provided. Therefore, while maintaining consistent output levels is vital for return amplifiers, it's more common for forward amplifiers to have different output levels based on varying downstream requirements. This distinction highlights the specific operational needs of both types of amplifiers in a telecommunications context, ensuring optimal performance and functionality across the distribution network.

## 10. Above what frequency are feed-thru connectors not typically recommended?

- A. 100 MHz
- B. 300 MHz
- C. 550 MHz**
- D. 1000 MHz

Feed-thru connectors are typically designed for use at lower frequencies, where their performance characteristics are optimal. As the frequency increases, the impedance and insertion loss characteristics of feed-thru connectors can deteriorate. This means that signals can reflect, leading to potential degradation in performance, particularly in high-frequency applications. In many standard practices within the telecommunications and networking fields, connections above 550 MHz begin to experience significant challenges in maintaining signal integrity through feed-thru connectors. This is due to factors such as increased electromagnetic interference, decreased fidelity of the signal, and the physical properties of the connectors themselves which may not be suited for high-frequency signals. Therefore, the recommendation is to use other types of high-frequency connectors or adaptors that are designed for performance at these frequency levels. While there are connectors designed for frequencies above 550 MHz, they are typically more specialized and may not work as effectively as other designed solutions that handle such frequencies. Hence, the choice aligns correctly with standard frequency management practices in data communications and signal integrity considerations.

# 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://nctiservicetech.examzify.com>**

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

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