

NCCER INSTRUMENTATION CERTIFICATION 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

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- 1. What base is the binary number system?**
 - A. Base 10
 - B. Base 8
 - C. Base 2
 - D. Base 16
- 2. The selection and interconnection of devices in an instrumentation channel that determine the stability of the process is referred to as what?**
 - A. Control channel
 - B. Control loop
 - C. Feedback network
 - D. Instrumentation setup
- 3. What is the primary function of a power supply in a PLC?**
 - A. Convert digital signals
 - B. Provide power to all modules
 - C. Facilitate communication
 - D. Store excess energy
- 4. What phenomenon is described by measuring pressure at a point in a fluid?**
 - A. Manometric readings
 - B. Hydrostatic pressure
 - C. Dynamic flow
 - D. Evaporative cooling
- 5. What type of input does a PID controller primarily manage?**
 - A. Analog
 - B. Digital
 - C. True/False
 - D. Binary
- 6. What is another name for a feedback loop?**
 - A. Open loop
 - B. Control loop
 - C. Closed loop
 - D. Direct loop

7. The device principle of an RTD is that resistance varies linearly with -----
- A. pressure
 - B. temperature
 - C. volume
 - D. humidity
8. Which device is used to measure pressure?
- A. Bourdon tube
 - B. Bellows
 - C. Manometer
 - D. Barometer
9. Since what year has the programmable logic control (PLC) been used in the industry?
- A. 1975
 - B. 1980
 - C. 1968
 - D. 1995
10. What instrument uses a float in a tapered tube to indicate flow?
- A. Flow switch
 - B. Rotameter
 - C. Turbine meter
 - D. Ultrasonic flowmeter

Answers

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

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Explanations

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1. What base is the binary number system?

- A. Base 10
- B. Base 8
- C. Base 2**
- D. Base 16

The binary number system is defined as having a base of 2. This means that it uses only two digits: 0 and 1. Each digit in a binary number represents a power of 2, with the rightmost digit representing 2^0 , the next representing 2^1 , and so forth. This system is fundamental in computing and digital electronics because it aligns perfectly with the off/on states of binary logic, where '0' can represent an off state and '1' an on state. In contrast, the other number systems mentioned—base 10 (decimal), base 8 (octal), and base 16 (hexadecimal)—utilize different sets of digits, with base 10 using ten digits (0 through 9), base 8 using eight digits (0 through 7), and base 16 using sixteen digits (0 through 9 and A through F). Each of these systems serves its purpose in various applications, but they do not align with the fundamental principle of the binary system, which is exclusively based on the two digits of 0 and 1. Therefore, the binary system's base is unequivocally 2.

2. The selection and interconnection of devices in an instrumentation channel that determine the stability of the process is referred to as what?

- A. Control channel
- B. Control loop**
- C. Feedback network
- D. Instrumentation setup

The term that describes the selection and interconnection of devices in an instrumentation channel, which ultimately determines the stability of a process, is known as a control loop. A control loop consists of various components, including sensors, controllers, actuators, and the process itself. This arrangement allows for the continuous monitoring and adjustment of the process to maintain desired operating conditions. The effectiveness of a control loop is crucial because it impacts the system's ability to respond to disturbances and maintain stability. A well-designed control loop ensures that feedback from the process is used to make appropriate adjustments, thereby enhancing stability and performance. Other terms like control channel and instrumentation setup may involve aspects of instrumentation and control but do not specifically capture the dynamic and feedback-driven nature of the control loop as it relates to maintaining process stability. Meanwhile, the feedback network pertains more to the way information is relayed back to the controller rather than the overall integration and effectiveness of the entire loop. Thus, the correct designation for this set of interconnections and devices is indeed a control loop.

3. What is the primary function of a power supply in a PLC?

- A. Convert digital signals
- B. Provide power to all modules**
- C. Facilitate communication
- D. Store excess energy

The primary function of a power supply in a Programmable Logic Controller (PLC) is to provide power to all modules. In a PLC system, the power supply is essential because it delivers the electrical energy required for the operation of the processor, input and output modules, and any other components connected to the PLC. Without a stable and adequate power supply, the PLC would not function properly, leading to potential failures in the automation process. In contrast, modules within a PLC system may handle various functions, such as converting signals or facilitating communication. However, these tasks depend on the power supply being operational. Storing excess energy is not typically a function of a power supply in this context, making the primary role of supplying power to the entire system crucial for overall operations. Understanding this function helps reinforce the importance of ensuring proper power management within PLC systems.

4. What phenomenon is described by measuring pressure at a point in a fluid?

- A. Manometric readings
- B. Hydrostatic pressure**
- C. Dynamic flow
- D. Evaporative cooling

Measuring pressure at a point in a fluid is associated with hydrostatic pressure. Hydrostatic pressure refers to the pressure exerted by a column of fluid due to the force of gravity. This phenomenon is observed when a fluid is at rest, and the pressure at any point within the fluid increases with depth. The pressure can be calculated using the formula $P = \rho gh$, where P is the pressure, ρ is the density of the fluid, g is the acceleration due to gravity, and h is the height of the fluid column above the point where the pressure is measured. In a hydrostatic scenario, it is crucial to recognize that the pressure not only depends on the depth but also on the density of the fluid and gravitational force acting on it, making this measurement fundamental in various applications, such as in fluid dynamics and engineering.

5. What type of input does a PID controller primarily manage?

- A. Analog**
- B. Digital
- C. True/False
- D. Binary

A PID (Proportional-Integral-Derivative) controller primarily manages analog input. This is because PID controllers are designed to operate in continuous systems where they regulate a variable, such as temperature, pressure, or flow. The analog input allows for continuous measurement and adjustment of these variables, enabling the controller to make real-time corrections to maintain the desired setpoint. In essence, the analog input provides a continuous range of values that the PID controller can utilize to calculate the necessary output. This continuous input is crucial for the PID algorithm to function effectively, allowing it to respond to changes in the process variable smoothly and accurately. The proportional, integral, and derivative actions of the controller all rely on this continuous data for precise control of the system dynamics. In contrast, digital, true/false, and binary inputs represent discrete signals and lack the nuance and detail needed for the fine-tuned control that a PID controller offers. These other input types are not suited for the dynamic nature of processes where PID control is typically applied.

6. What is another name for a feedback loop?

- A. Open loop
- B. Control loop
- C. Closed loop**
- D. Direct loop

A feedback loop is best described as a closed loop system because it incorporates the principle of using feedback to control the process. In closed loop systems, output information is fed back into the input, allowing for adjustments or corrections to be made based on the performance of the system. This continuous monitoring and adjustment help to maintain the desired performance of the system and increase reliability and efficiency. In contrast to closed loop systems, open loop systems do not use feedback to influence their operation. Instead, they operate based purely on initial input, regardless of the output results. This distinction is essential because feedback is what allows closed loop systems to respond dynamically to changes in conditions or demands. Control loop is a broader term that can refer to both open and closed loops in terms of controlling processes but does not specifically highlight the feedback aspect. Direct loop is not a commonly used term in instrumentation and control theory, making it less relevant to the concept of a feedback loop. Hence, closed loop remains the most accurate name for a feedback loop due to its dependence on output feedback for regulation and improvement.

7. The device principle of an RTD is that resistance varies linearly with -----

- A. pressure
- B. temperature**
- C. volume
- D. humidity

The principle of an RTD, or Resistance Temperature Detector, is based on the property of metals that their electrical resistance changes in response to temperature variations. Specifically, for most materials used in RTDs, such as platinum, the resistance increases linearly as the temperature rises. This relationship allows for accurate and precise temperature measurements, as the change in resistance can be directly correlated to temperature changes. The RTD operates on the fact that as the temperature increases, the atoms within the material vibrate more, leading to increased resistance to the flow of electric current. This linear relationship is fundamental to the functioning of the device, enabling it to be used effectively in a wide range of temperature sensing applications.

8. Which device is used to measure pressure?

- A. Bourdon tube
- B. Bellows**
- C. Manometer
- D. Barometer

The Bourdon tube is specifically designed for measuring pressure and is one of the most widely used pressure measurement devices. It operates on the principle of the elastic deformation of a curled tube when subjected to pressure. As the pressure inside the tube increases, the tube tends to uncoil or straighten, causing a pointer attached to it to move on a dial, providing a direct reading of the pressure. While the bellows, manometer, and barometer are also pressure measuring devices, they operate on different principles. Bellows are typically used in applications requiring the measurement of low-pressure changes or the transmission of pressure signals, converting pressure changes into mechanical movement. A manometer is used for measuring the pressure of gases or liquids, typically in small-range applications, and works by balancing the liquid column against the pressure being measured. A barometer measures atmospheric pressure and is essential for weather forecasting and determining altitude. Understanding the specific applications and operational principles of these devices is crucial for selecting the right instrument for particular measurement scenarios. This contextual knowledge helps ensure accurate and appropriate pressure measurements in various environments.

9. Since what year has the programmable logic control (PLC) been used in the industry?

- A. 1975
- B. 1980
- C. 1968**
- D. 1995

The correct answer is that programmable logic controllers (PLCs) have been in use since 1968. PLCs were developed to replace relay-based control systems, offering greater flexibility, reliability, and ease of programming. The technology was particularly advantageous in manufacturing and industrial automation, where the need for rapid adjustments and reconfigurations of control systems was essential. The introduction of PLCs marked a significant advancement in control technology, enabling industries to improve efficiency and reduce downtime. This historical context helps underscore the impact PLCs have had in streamlining operations and enhancing productivity across various sectors.

10. What instrument uses a float in a tapered tube to indicate flow?

- A. Flow switch
- B. Rotameter**
- C. Turbine meter
- D. Ultrasonic flowmeter

The instrument that uses a float in a tapered tube to indicate flow is a rotameter. A rotameter functions based on the principle of variable area flow measurement. As fluid flows through the tapered tube, the flow causes the float to rise to a position that is determined by the flow rate. The wider section of the tube allows for an increase in flow area as the flow increases, causing the float to move up, indicating higher flow rates. The position of the float corresponds directly to the flow rate, which is typically marked on a scale alongside the tube. This design allows for straightforward visual measurement of flow without the need for additional sensors or electronic components, making it a widely used instrument in various industries for monitoring fluid flow rates.

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://nccerinstrumentation.examzify.com>

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

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