

PMMI PROGRAMMABLE LOGIC CONTROLLERS (PLC) 1 PRACTICE TEST (SAMPLE) STUDY GUIDE



Prepare with structure. Pass with confidence



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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. Which statement describes the default states of XIO and XIC?

- A. XIO is normally closed; XIC is normally open
- B. XIO is normally open; XIC is normally closed
- C. Both are normally open
- D. Both are normally closed

2. Which of the following is NOT a component of a PLC?

- A. Input Modules
- B. USB Port
- C. Processor Module
- D. I/O Chassis

3. What does the Count Up (CTU) instruction do in a PLC counter?

- A. Increases the instruction tag's Accumulated value by one each time the rung containing the instruction goes from false to true.
- B. Decreases the instruction tag's Accumulated value by one each time the rung containing the instruction goes from false to true.
- C. Resets the Accumulated value to zero when the rung becomes true.
- D. Sets the Done bit immediately when scanned.

4. Which description best characterizes Structured Text in PLC programming?

- A. Ladder Logic resembles a ladder and uses rungs.
- B. Sequential Function Chart uses steps and transitions.
- C. Structured Text is a high-level programming language that uses text statements to define the operation of the PLC.
- D. Function Block Diagram encapsulates other languages within blocks.

5. Which condition relates to air as an interlock safety signal?

- A. Oil temperature is at a safe level
- B. Air pressure is at a safe level
- C. Guards in place
- D. Temperature of the control panel

6. Which element is used to keep an output energized after the input signal has been removed?

- A. Memory/Seal-In
- B. And
- C. Or
- D. Not

7. Which statement correctly describes the characteristics of Sink Input and Source Input?

- A. Sink Input is Active High; the switch is on the positive side; Voltage flows from PLC to device; If device is enabled voltage will be present at PLC terminal.
- B. Source Input is Active High; The switch/input/device is on the positive side of the circuit or source voltage. Voltage flows from PLC to device.
- C. Sink Input is Active Low; the switch is on the ground side; Voltage flows from power source through switch/input/device to PLC. If device is enabled voltage will be present at PLC terminal.
- D. Source Input is Active Low; the switch/input/device is on the negative side of the circuit or source voltage.

8. Which statement describes the difference between PLC input logic and hardwired switches?

- A. PLC can use either normally opened or normally closed logic with a single set of switch contacts
- B. PLC cannot simulate hardwired logic
- C. PLC must use separate contact for each logic state
- D. PLC always uses normally open contacts

9. What does the 24V DC digital I/O imply about wiring components?

- A. Components in the I/O subsystem should be compatible with 24V DC operation.
- B. Any voltage level can be used as long as it powers the coil.
- C. 120V AC is standard for digital I/O.
- D. 5V DC is typical for digital I/O.

10. What is the purpose of a latch in PLC control, and when might you use one?

- A. Adds an error flag on fault.
- B. Holds a condition until a reset; example: keeping a pump on after a momentary start until a stop condition.
- C. Provides a temporary delay before a output turns on.
- D. Measures temperature with a sensor.

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Answers

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

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Explanations

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1. Which statement describes the default states of XIO and XIC?

A. XIO is normally closed; XIC is normally open

B. XIO is normally open; XIC is normally closed

C. Both are normally open

D. Both are normally closed

The concept being tested is how ladder logic contacts behave in their resting state and how their names indicate that behavior. In ladder diagrams, a normally open contact is open when the input is not energized and closes when the input is energized. A normally closed contact is closed when the input is not energized and opens when the input is energized. XIC stands for Examine If Closed and is implemented as a normally open contact in practice; it remains open when the input is off and closes to pass current when the input is energized. XIO stands for Examine If Open and is implemented as a normally closed contact; it remains closed when the input is off and opens to stop current when the input is energized. So the default states align with the naming: XIO is normally closed, and XIC is normally open.

2. Which of the following is NOT a component of a PLC?

A. Input Modules

B. USB Port

C. Processor Module

D. I/O Chassis

Think of a PLC as a compact computer system designed to control field devices. Its main hardware pieces include a processor module that runs the program, input modules that read sensors, output modules that drive actuators, and an I/O chassis that holds these modules and provides the backplane for communication. A USB port is typically an external interface used for programming, diagnostics, or firmware updates rather than a fundamental PLC hardware part. So, while some PLCs may offer USB for convenience, it is not considered part of the main PLC hardware. Therefore, USB Port is the option that is not a PLC component.

3. What does the Count Up (CTU) instruction do in a PLC counter?

A. Increases the instruction tag's Accumulated value by one each time the rung containing the instruction goes from false to true.

B. Decreases the instruction tag's Accumulated value by one each time the rung containing the instruction goes from false to true.

C. Resets the Accumulated value to zero when the rung becomes true.

D. Sets the Done bit immediately when scanned.

Count Up increments the accumulated value by 1 on every rising edge of the rung's truth. In other words, when the rung goes from off to on during a scan, the accumulator increases by one. If the rung stays true across scans, it does not keep counting each time; it only counts when the input transitions from false to true. The counter also uses a preset to determine when the Done bit is set, signaling the count has reached the target. This edge-triggered, single-increment-on-rise behavior is exactly what defines a Count Up counter.

4. Which description best characterizes Structured Text in PLC programming?

- A. Ladder Logic resembles a ladder and uses rungs.
- B. Sequential Function Chart uses steps and transitions.
- C. Structured Text is a high-level programming language that uses text statements to define the operation of the PLC.**
- D. Function Block Diagram encapsulates other languages within blocks.

Structured Text is a high-level, text-based language in PLC programming that lets you write logic using statements, much like traditional programming languages. This contrasts with diagrammatic languages: Ladder Logic uses graphical rungs, Sequential Function Chart uses steps and transitions, and Function Block Diagram uses interconnected blocks. With Structured Text you can declare variables, use data types, and implement control structures such as IF...THEN...ELSE, CASE, and FOR loops, making it suitable for complex calculations and algorithms. An example would be: `Temperature := SetPoint + Offset * Multiplier; IF FaultDetected THEN Alarm := TRUE; END_IF;` This approach focuses on expressing the operation in clear text, which is why it's described as a high-level text-based language for PLCs.

5. Which condition relates to air as an interlock safety signal?

- A. Oil temperature is at a safe level
- B. Air pressure is at a safe level**
- C. Guards in place
- D. Temperature of the control panel

Interlocks ensure a machine runs only when guarding conditions are safe, and using air as the signaling mechanism means the system depends on air pressure to verify that the guard is in place. When the air pressure is at a safe level, the pneumatic interlock stays engaged and the machine is permitted to run. If the air pressure drops, leaks occur, or the supply is interrupted, the interlock releases and the machine stops to protect the operator. The other factors listed aren't tied to the interlock signal: oil temperature is a process condition, guarding alone is a physical safety feature, and control panel temperature isn't used as the air-based interlock signal. So, air pressure being at a safe level is the condition that relates to air as the interlock safety signal.

6. Which element is used to keep an output energized after the input signal has been removed?

- A. Memory/Seal-In**
- B. And
- C. Or
- D. Not

The ability to keep an output energized after the input is removed comes from a memory element called a seal-in (latch). When the input is true, the output energizes and its own auxiliary contact closes, creating a hold-in path that keeps the circuit closed even if the input goes away. This self-holding path maintains the output until something else breaks the circuit (like a stop input). In contrast, And, Or, and Not do not provide this memory capability: And requires both inputs to be present, Or only responds to inputs but won't maintain state after inputs drop, and Not inverts a signal without holding the state.

7. Which statement correctly describes the characteristics of Sink Input and Source Input?

- A. Sink Input is Active High; the switch is on the positive side; Voltage flows from PLC to device; If device is enabled voltage will be present at PLC terminal.
- B. Source Input is Active High; The switch/input/device is on the positive side of the circuit or source voltage. Voltage flows from PLC to device.
- C. Sink Input is Active Low; the switch is on the ground side; Voltage flows from power source through switch/input/device to PLC. If device is enabled voltage will be present at PLC terminal.**
- D. Source Input is Active Low; the switch/input/device is on the negative side of the circuit or source voltage.

Sink inputs are designed to be activated by pulling the input channel toward ground, so the switch or load sits on the low side of the circuit. When the external device provides power and the switch on the ground side closes, current flows into the PLC input and to ground. The PLC senses the input as ON when the line at the input is pulled toward 0 V (low), hence the term active-low. This is why the description that the switch is on the ground side and the input is active when it's pulled low correctly reflects sink input behavior. In contrast, a source input would be active-high, with the switch on the positive side so the PLC input sees a high signal when the external device is energized.

8. Which statement describes the difference between PLC input logic and hardwired switches?

- A. PLC can use either normally opened or normally closed logic with a single set of switch contacts**
- B. PLC cannot simulate hardwired logic
- C. PLC must use separate contact for each logic state
- D. PLC always uses normally open contacts

In PLC input logic, you can decide how a switch's signal is interpreted in software, so the same physical contact can represent either normally open or normally closed behavior. By using a NO contact in the rung or by applying an inversion (or using a NC contact) in the ladder logic, the PLC can treat the input as true when the switch closes or as true when the switch opens. This flexibility means one set of switch contacts can implement either polarity without changing the hardware. In contrast, hardwired logic ties the behavior directly to the physical wiring, so you'd need different hardware (or wiring) to achieve the opposite logic.

9. What does the 24V DC digital I/O imply about wiring components?

- A. Components in the I/O subsystem should be compatible with 24V DC operation.**
- B. Any voltage level can be used as long as it powers the coil.
- C. 120V AC is standard for digital I/O.
- D. 5V DC is typical for digital I/O.

The main idea is that 24V DC digital I/O defines the voltage level and return path that the PLC expects for its signals. Any device wired to these I/O points must be designed to operate at 24V DC and share the same 0V reference. Power sensors, switches, and actuators should be powered from a 24V DC supply, and their outputs or inputs connected to the PLC according to whether the I/O is configured to source or sink current. Using a different voltage (like 120V AC or 5V DC) can exceed the module's input thresholds or overdrain its drivers, leading to damage or unreliable behavior. Pay attention to proper polarity for DC, provide a return path, and include appropriate protection (fuses, diodes, snubbers) for inductive loads. In short, all wired components must be compatible with 24V DC and the module's wiring scheme.

10. What is the purpose of a latch in PLC control, and when might you use one?

- A. Adds an error flag on fault.
- B. Holds a condition until a reset; example: keeping a pump on after a momentary start until a stop condition.**
- C. Provides a temporary delay before a output turns on.
- D. Measures temperature with a sensor.

A latch in PLC control serves as a memory that keeps an output on even after the initiating input is released. In ladder logic this is often done with a seal-in circuit: when the start input is true, the output energizes, and a contact in series with that output closes to feed the coil back, so the circuit stays energized after the start button is released. It remains latched until a reset or stop input breaks the feedback path. You'd use this when a momentary action should produce a sustained result, such as keeping a pump running after a brief start signal until a stop command is issued. Other functions described in the options—signaling faults, creating a delay with a timer, or reading a temperature with a sensor—don't capture the idea of holding a state, which is the essence of a latch.

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://pmmiplc1.examzify.com>

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

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