

**SARDAR PATEL UNIVERSITY**

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B.Sc. (6<sup>th</sup> Sem) Examination - March/April-2018 [CBCS]Monday, 2<sup>nd</sup> April, 2018,

10:00 AM - 01:00 PM

**US06CINS04 (Instrumentation)**

Programmable Logic Controller (PLC) - 2

Maximum Marks: 70

**Que 1 Each question below gives a multiple choice of answers. Choose the most appropriate [10] one.**

- 1 \_\_\_\_: Consists of One Rung of Logic, which is Placed at the End of The Ladder Diagram.
 

a) D Flip Flop	b) One Shot
c) RS Flip Flop	d) T Flip Flop
- 2 \_\_\_\_: Supply Clock (Trigger) Pulse For the D, T, and J-K Flip Flops.
 

a) Timer	b) Sequencer
c) One Shot	d) Flasher
- 3 \_\_\_\_: Special Counter Ladder Function that Allows the PLC to Perform Timing Operations Based on a Precise Internal Clock.
 

a) Timed Sequencer	b) Timed One Shot
c) Flasher	d) Timer
- 4 In Mnemonic PLC Programming Code, the Termination Command For a Line of Code is Generally \_\_\_\_\_.
 

a) STO	b) LD
c) ENTER	d) STR
- 5 In Mnemonic PLC Programming Code, the \_\_\_\_ Command Tells the Controller That the Following Set of Contacts Composes One Branch of Logic.
 

a) LD	b) STO
c) STR	d) ENTER
- 6 In Mnemonic PLC Programming Code, the \_\_\_\_ Command Tells the Controller That the Previous Logic is To Control the Coil That Follows the STO Command.
 

a) STR	b) ENTER
c) LD	d) STO
- 7 The Inputs of Modern PLCs are Generally \_\_\_\_\_.
 

a) 240 AC Voltage	b) 24 DC Voltage
c) 120 AC Voltage	d) Opto-Isolators
- 8 \_\_\_\_ Relay Contact is a Single Pole Normally Open Contact.
 

a) FORM A	b) FORM B
c) FORM C	d) FORM A and FORM C
- 9 If the Voltage Being Measured Will Never Be Negative, Then \_\_\_\_ Input is the Best Choice.
 

a) Unipolar (Positive Only)	b) Bipolar
c) Unipolar and Bipolar	d) Unipolar (Negative Only)
- 10 For a Unipolar Converter, the Voltage Resolution is the Full Scale Voltage Divided by \_\_\_\_, where n is the Bit Resolution.
 

a) $2n-1$	b) $2^n$
c) $2n^2$	d) $2n+1$

- Que 2 Short Questions (Attempt any TEN) [20]**
- 1 Draw Truth Table and Ladder Diagram For RS Flip Flop.
  - 2 Explain Briefly Flasher.
  - 3 Explain the Importance of Cascading of Timers.
  - 4 Write Mnemonic PLC Programming Codes For  $Lamp = \overline{Sensor A} + Sensor B$ .
  - 5 Write Mnemonic PLC Programming Codes For  $Y = \overline{A}B + C$
  - 6 Write Mnemonic PLC Programming Codes For  $OUT10 = IN1 \cdot IN2 \cdot IN3$
  - 7 Explain PLC Output Wiring Briefly.
  - 8 Draw Diagram of PLC Non-Isolated Input Wiring.
  - 9 Differentiate: Relay Outputs and Solid State Outputs Associated With PLC Wiring.
  - 10 Differentiate: Unipolar and Bipolar Inputs.
  - 11 A 12-Bit, 10 Volt Bipolar Analog Output has a Maximum Output Current Capability of 20 mA. It is Connected to a Load that has a Resistance of 330 ohms. Will this System Work Correctly?
  - 12 A voltage of 3.500 Volts is Applied to an 8 - bit, 5 volt Unipolar Analog Input of a PLC. The PLC Analog Input Register shows a Value of 263<sub>8</sub>. Is the Analog Input working correctly?
- Que 3 [A] Explain Counter With Necessary Ladder Diagram. [06]**  
**[B] Write a Note on Timed One Shot. [04]**
- OR**
- [C] Explain Timer With Necessary Ladder Diagram. [06]**  
**[D] Discuss D Flip Flop Associated With PLC With Necessary Truth Table and Ladder Diagram. [04]**
- Que 4 [A] Write a Detailed on PLC Simple Branches With Necessary Example. [06]**  
**[B] Discuss AND Ladder Rung With Necessary Ladder Diagram and Mnemonic Programming Codes. [04]**
- OR**
- [C] Write a Detailed on PLC Complex Branches With Necessary Example. [06]**  
**[D] Discuss OR Ladder Rung With Necessary Ladder Diagram and Mnemonic Programming Codes. [04]**
- Que 5 [A] Write a Detailed Note on PLC Relay Outputs. [10]**
- OR**
- [B] Give an Account of Inputs Having a Single Common in Terms of PLC. [10]**
- Que 6 [A] Write a Note on Analog (A/D) Input With Respect to Programmable Logic Controller. [06]**  
**[B] Give an Account of Analog (D/A) Output. [04]**
- OR**
- [C] Write a Note on Analog Input Potential Problems With Respect to Programmable Logic Controller. [06]**  
**[D] Write a Note Analog Data Handling. [04]**