

22526

23242

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

5 × 2 = 10

- (a) Explain the concept of NO and NC contact.
- (b) Draw the symbol of (i) proximity switch (ii) pressure switch.
- (c) List any four advantages of PLC.
- (d) Draw ladder diagram for Ex-OR logic gate.
- (e) List the types of timer used in PLC.
- (f) Draw ladder diagram for DOL starter.
- (g) State the function of RTU and MTU w.r.to SCADA.



2. Attempt any THREE :**3 × 4 = 12**

- (a) Differentiate between control wiring & power wiring (Any 4 points).
- (b) What is opto-isolator ? Explain role of opto-isolator in PLC.
- (c) List the types of Counter. Explain Down counter in detail with an example.
- (d) Draw ladder diagram for semi-automatic star delta starter.

3. Attempt any THREE :**3 × 4 = 12**

- (a) Draw control and power circuit diagram for conveyor control.
- (b) Draw a neat block diagram of PLC. Explain function of each block.
- (c) Draw a ladder diagram for 3 motor operation for following condition :
 - (i) Start push button starts motor M_1 . After 15 seconds M_2 and M_3 starts.
 - (ii) Stop push button stops M_3 and after 15 seconds motor M_2 and M_1 .
- (d) List the types of SCADA system. Explain distributed SCADA system in detail.

4. Attempt any THREE :**3 × 4 = 12**

- (a) What is automation ? Explain its need and benefit.
- (b) Draw ladder diagram for forward stop reverse control of 3 ϕ IM.
- (c) Draw ladder diagram for PLC based water level control with suitable example.
- (d) Draw block diagram of AC digital input module & explain the function of each block.
- (e) Explain the function of
 - (1) Communication module
 - (2) Stepper motor control module
 - (3) PID control module
 - (4) High speed counter module

5. Attempt any TWO :**2 × 6 = 12**

- (a) What is soft starter ? Explain working of soft starter with an example.
- (b) Draw ladder diagram for traffic light control system and explain the function of each rung.
- (c) Develop a generalized DCS architecture for control of a plant.

6. Attempt any TWO :**2 × 6 = 12**

- (a)
 - (i) List the types of memory & explain the function of memory in PLC.
 - (ii) List the types of PLC based on number of input, output.
- (b) Explain the working of PLC based bottle filling system. Draw the ladder diagram for same.
- (c) Draw the ladder diagram for :

- | | | |
|--------------|---------------|-----------------|
| (1) NOT gate | (2) NOR gate | (3) OR gate |
| (4) AND gate | (5) NAND gate | (6) Ex-NOR gate |

Also write truth table for each logic gate.
