

22585

24225

03 Hours / 70 Marks

Seat No.

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

Marks

1. **Attempt any FIVE of the following:** **10**
- a) Differentiate between Field Level and Enterprise level automation hierarchy.
 - b) State application areas of PLC.
 - c) Explain following terms with respect to PLC
 - i) Scan time
 - ii) Speed of execution
 - d) List the PLC output control devices.
 - e) Define with respect to SCADA:
 - i) Tags,
 - ii) Items
 - f) List any four comparison instructions.
 - g) Give examples of SCADA system. (Any four)

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- 2. Attempt any THREE of the following:** **12**
- a) Define industrial automation and list its need.
 - b) Sketch block diagram Analog I/O Module of PLC also write Specification of it.
 - c) List Different PLC programming languages. Explain any one with example.
 - d) List of any four relay type instructions with their symbols
- 3. Attempt any THREE of the following:** **12**
- a) Draw basic architecture of SCADA and explain in brief.
 - b) Explain Field level automation hierarchy in detail.
 - c) Sketch and explain block diagram of PLC
 - d) Explain PLC programming scan cycle.
 - e) Draw format of following instructions with respect to PLC:
 - i) Down Counter,
 - ii) ON Delay timer.
- 4. Attempt any THREE of the following:** **12**
- a) Explain "an OPC" in detail.
 - b) Explain Direct Digital Control (DDC) in detail with example.
 - c) Draw block diagram of Power supply used in PLC and explain each block in detail.
 - d) Write Ladder diagram program for Elevator system. Assume suitable system design for the same.
 - e) Explain integrated and flexible automation.

- 5. Attempt any TWO of the following:** **12**
- a) Describe the current sinking and current sourcing in detail with respect to PLC.
 - b) Explain Internal relay instruction of PLC with suitable example.
 - c) Write ladder program for Traffic light control system with following conditions:
 - i) red light ON for 30 sec
 - ii) green light ON for 25 sec
 - iii) yellow light on for 05 sec
 - iv) Repeat the sequence until stop push button is pressed.
- 6. Attempt any TWO of the following:** **12**
- a) Illustrate use of ON Delay timer instruction with example.
 - b) Write PLC ladder diagram for following motor sequence:
 - i) Start button starts motor M1.
 - ii) After 10 sec M1 is off and M2 is ON.
 - iii) After 5 sec motor M2 is off.
 - iv) Stop push button stops M1, M2, if pressed any time during process.
 - c) List different Communication Protocol used for SCADA. Explain any one in detail.
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