

22534

22232

3 Hours / 70 Marks

Seat No.

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- 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) 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) List different systems used in Industrial automation.
- (b) Draw block diagram of power supply used in PLC.
- (c) List any two names of (i) Speciality I/P Module (ii) Speciality O/P Module.
- (d) List any four comparison instructions.
- (e) Draw a symbol of OFF delay timer. (Non Retentive Type) For delay of 08 seconds.
- (f) List the functions of electrical drives. (any four)
- (g) Define w.r.t. to SCADA : (i) Tags, (ii) Items.



- 2. Attempt any THREE of the following : 12**
- (a) Draw automation hierarchy and explain each level in brief.
 - (b) Draw a neat block diagram of PLC and explain function of each block in brief.
 - (c) Define redundance in PLC. Explain redundancy in PLC with suitable example.
 - (d) Describe discrete DC input module of PLC with neat block diagram.
- 3. Attempt any THREE of the following : 12**
- (a) Explain the Scanning Cycle in PLC.
 - (b) Compare AC and DC drives on any four points.
 - (c) Compare fixed and flexible automation on any four points.
 - (d) List I/O module selection criteria for PLC. (any four)
- 4. Attempt any THREE of the following : 12**
- (a) Draw basic architecture of SCADA. Explain it in brief.
 - (b) List any four applications of SCADA. Explain any one application of SCADA in brief.
 - (c) List any four input device and four output devices that can be connected to PLC.
 - (d) Select device that can be used with PLC to control the speed of AC motor. Explain how.
 - (e) Describe the steps involved in developing SCADA application with any simple example.

5. Attempt any TWO of the following :**12**

- (a) Enlist different specification of AC drive.
- (b) Write a PLC ladder diagram for following motor sequence :
 - (i) Start PB button starts motor M1.
 - (ii) After 08 sec M2 is ON.
 - (iii) After 15 sec motor M3 is ON.
 - (iv) Stop push button stops all motors, if pressed any time during the process.
- (c) Draw a neat wiring diagram (interfacing diagram) of following I/O devices with appropriate PLC module :
 - (i) PB (NO type)
 - (ii) Limit Switch, (NC type)
 - (iii) Lamp – 24 V DC
 - (iv) Fan – 230 V AC

6. Attempt any TWO of the following :**12**

- (a) Compare PLC and SCADA on any six points.
 - (b) Draw ladder diagram for following sequence :
 - (i) When START PB is pressed Lamp 1 is ON for 06 seconds.
 - (ii) After 06 seconds lamp 2 is ON for 12 seconds.
 - (iii) After 12 seconds Alarm is ON for 02 seconds.
 - (iv) When STOP PB is pressed during process, stops the process immediately.
 - (c) Draw Ladder diagram for automatic bottle filling system. Assume suitable system design for the same.
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