

22534

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- 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 :

10

- (a) State the need of automation.
- (b) List different types of PLC.
- (c) Name any four special I/O modules of PLC.
- (d) Draw PLC I/O addressing format.
- (e) List any four PLC programming languages.
- (f) List types of electrical motor drives.
- (g) List various editors of SCADA.

2. Attempt any THREE :

12

- (a) List types of automation system. Explain each in brief.
- (b) Differentiate fixed and modular PLC on any four point.
- (c) Draw a block diagram of Discrete AC input module of PLC. Explain each block in brief.
- (d) Draw a symbol of on-delay timer instruction. Explain its operation with neat waveform.

- 3. Attempt any THREE :** **12**
- (a) Draw a neat wiring (Interfacing) diagram of following I/O devices with appropriate PLC module :
 - (i) Push button – 24 VDC
 - (ii) Hooter – 230 VAC
 - (iii) Motor – 230 VAC
 - (iv) Level Switch – 24 VDC
 - (b) Draw generalized block diagram of electric drive. Explain each block in brief.
 - (c) State different tools of industrial automation. Explain any one in brief.
 - (d) Draw ladder diagram symbol with proper addressing for following instructions :
 - (i) Limit Test
 - (ii) Retentive timer
- 4. Attempt any THREE :** **12**
- (a) Draw typical architecture of SCADA. Explain its part.
 - (b) Explain the interfacing of PLC based application to SCADA.
 - (c) Draw memory organization of PLC. Explain function of any two element of organization.
 - (d) Differentiate AC and DC drives on any four point.
 - (e) List down various steps to develop SCADA application of traffic light control.
- 5. Attempt any TWO :** **12**
- (a) List any six factors influencing on selection of electrical drives.
 - (b) Draw a ladder diagram for stepper motor control.
 - (c) Segregate following Input Output devices into discrete input device, discrete output device, analog input device, and analog output device :
 - (i) Limit switch
 - (ii) Control valve
 - (iii) Pressure transmitter
 - (iv) Proximity switch
 - (v) Hooter
 - (vi) Red Lamp

6. Attempt any TWO :

- (a) Draw SCADA screen of water distribution application. List various dynamic animation linkage.
- (b) Two pulser start at the same time. Pulse output J is pulse for 2 second at every 12 seconds. Pulse output K is to pulse for 2 second at every 4 seconds. Write a ladder logic for above.
- (c) Draw the ladder diagram for following Boolean Expression :

$$AB + \bar{C}D + E = Y_1$$

$$FGH + I\bar{J} = Y_2$$

$$Y_1 + Y_2 = Q$$
