22223

3 Hours / 70 Marks   Seat No.

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) 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) State the need and importance of Industrial Automation..

b) What is redundancy in PLC?

c) List any four names of PLC programming languages.

d) List any four relay type instructions with their symbols.

e) State benefits of SCADA.

f) State function of I/o module of PLC.

g) List different editors used in SCADA.

2. Attempt any THREE of the following: **12**

a) Describe analog control, digital control supervisory control and direct digital control.

b) Explain functions of different parts of PLC.

c) Describe the Do's and Dont's for PLC installation.

d) State comparison and data handling instructions of PLC.

Marks

3. **Attempt any THREE of the following:** 12

    a) Define steps for creating SCADA screen for simple object.

    b) State types of Automation and explain any one.

    c) Describe the sinking and sourcing concept of PLC.

    d) Write ladder diagram program for car parking. Assume suitable conditions.

    e) Explain program scan cycle of PLC.

4. **Attempt any THREE of the following:** 12

    a) Explain the interfacing of PLC and SCADA system.

    b) Explain the concept of DCS. State its application.

    c) Draw and describe the block diagram of discrete O/P module of PLC.

    d) Draw ladder diagram for 3 motor operation for following conditions -
        i) Start push button starts motor m1
        ii) After 10 sec motor m2 starts and
        iii) After 15 sec motor m3 starts.

    e) List the advantages of programmable logic over hardwired relay logic.

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

    a) Explain any three i/p devices and three o/p devices that can be connected to PLC.

    b) Illustrate PLC timer in detail.

    c) Write ladder program for traffic light control system with following conditions -
        i) RED light on for 50 sec.
        ii) GREEN light on for 30 sec.
        iii) YELLOW light on for 10 sec.
        iv) Repeat the sequence until stop push button is pressed.

6.   **Attempt any <u>TWO</u> of the following:**   **12**

   a) Explain PLC and PC interfacing process.

   b) Write ladder program for conveyor system. Assume suitable system design for the same.

   c) State applications of SCADA. Describe any one application in detail.

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