22384

12425

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.

(8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) List different types of industrial automation.

(b) State the need for industrial automation.

(c) List different manufacturers of PLC.

(d) State benefits of industrial automation (any four).

(e) List any two input and output devices used to interface with PLC.

(f) List communication modules used with PLC.

(g) State different programming languages used in PLC.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) Draw the block diagram of typical industrial automation system.

(b) Compare fixed and modular PLC (any four points).

(c) Draw neat labelled block diagram of generalized PLC and explain the function of each block.

(d) Describe the factors that must be considered while wiring a PLC.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain scan cycle and scan time with respect to PLC.

(b) Draw the symbol for OFF delay timer instruction used in PLC in ladder programming and explain the meaning of following :

(i) EN (enable) bit (ii) DN (done) bit

(c) List Data Handling and bit type instruction used in PLC along with their symbols used in ladder program.

(d) Draw a neat wiring diagram of following I/O devices with appropriate PLC module :

(i) PNP Sensor (ii) Solenoid coil

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain watchdog function in PLC.

(b) Draw the ladder diagram for following Boolean expression :

(i) $Y(A, B, C, D) = A' B + A' D + B' D$

(ii) $Y (A, B, C) = AB + C'$

(c) Explain redundancy concept in PLC.

(d) List counter instruction used in PLC along with their symbol used in ladder programming.

(e) List types of PLC memory and describe them in brief.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Implement 4:1 multiplexer in PLC using ladder diagram.

(b) Draw the ladder diagram for traffic light control and explain the logic.

(c) State different control panel accessories of PLC and draw the wiring diagram of pressure switch with PLC i/p module.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) Draw ladder diagram for following logic functions :

(i) Two input OR function

(ii) Two input AND function

(iii) Two input EX-OR function

(b) Implement 1:8 de multiplexer in PLC using ladder diagram.

(c) Explain the format of sequencer and analog scaling instructions in PLC.