22526

12223

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.

Marks

1. Attempt any FIVE of the following : **10**

(a) Draw the symbols of following components used in industrial control circuits :

(i) Push button (NO)

(ii) Selector Switch

(iii) Relay

(iv) Pressure Switch

(b) Give the classification of PLC.

(c) State the need of automation.

(d) Define bit and word.

(e) State any two uses of HMI.

(f) Draw ladder diagram of seal-in-circuit w.r.t. PLC.

(g) Draw the ladder diagram for verifying the NAND and NOR logic.

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

(a) Compare between Power and Control circuit. (Any 4 points)

(b) Describe DC input module with neat block diagram.

(c) Draw a ladder diagram for 2 lamps having following conditions :

(i) Start Push button turn ON red lamp after 15 seconds yellow lamp turns ON.

(ii) Stop Push button turns OFF yellow lamp immediately and after 15 seconds Red lamp turns OFF.

(d) Develop the ladder diagram for DOL starter with OLR.

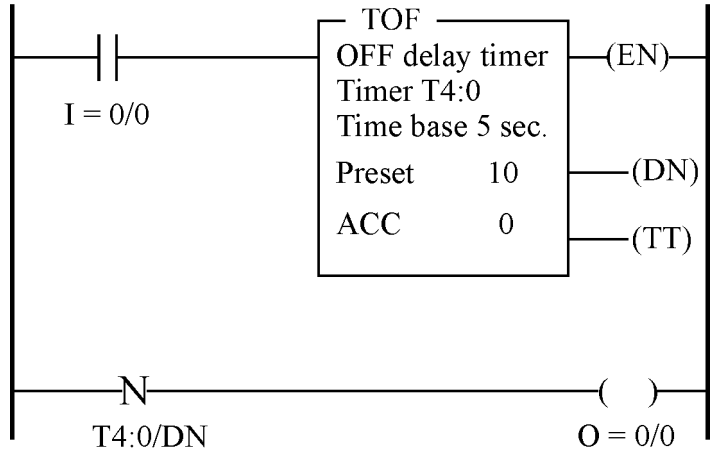
3. Attempt any THREE of the following : **12**

(a) Explain the instruction for UP counter with waveform.

(b) Describe monolithic SCADA architecture.

(c) Develop the ladder diagram for PLC based water level controller.

(d) Draw the timing diagram for following ladder program :



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

(a) Explain Latching Relay using PLC.

(b) Explain speciality module of PLC –

(i) Communication module

(ii) PID controller module

(c) Explain contactor with neat diagram.

(d) Draw control and power circuit of Hoist control.

(e) Describe analog input module with neat block diagram.

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

(a) Describe the block diagram of SCADA.

(b) Explain the working of PLC based stepper motor control with the help of ladder diagram.

(c) Develop a control and power circuit for automatic star-delta starter.

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

(a) Develop a ladder program for following conditions :

(i) Start push button starts motor M1, M2 and M3 immediately.

(ii) Stop push button stops motor M1 immediately and after 15 seconds motor M2 stops.

(iii) When motor M2 stops, after 15 seconds motor M3 stops.

(b) Explain the working of PLC based Traffic Light Control with the help of ladder program.

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