22526

21222

3 Hours / 70 Marks Seat No. | | | | | | | | |

15 minutes extra for each hour

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.

Marks

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

(a) Explain the function of Push button and limit switch used in control circuit.

(b) Distinguish between two wire and three wire control.

(c) Draw the symbols of following component used in industrial control circuit :

(i) ON/OFF push button

(ii) OLR Control contact

(d) Draw the block diagram of PLC in detail.

(e) State the use of Human Machine Interface.

(f) Draw the ladder program for verifying the AND and OR Logic gates.

(g) State the function of seal in circuit with respect to PLC.

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

(a) Explain the concept of control and power circuit diagram using DOL starter.

(b) Explain the block diagram and function of each part in PID controller.

(c) Draw the symbols of following relay type inspections :

(i) IF – OPEN

(ii) IF – CLOSE

(d) Develop a PLC Ladder Logic of DOL starter with OLR contact.

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

(a) Develop the control circuit for Star/Delta starter using timer, for starting of a 3 ϕ Induction motor.

(b) Draw block diagram of Analog Input–Output module of PLC with its specification.

(c) Classify timers of PLC and explain T_{ON} timer in detail.

(d) Develop the Ladder Logic program for Forward-Reverse control of 3ϕ induction motor.

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

(a) Explain the working of Soft starter with block diagram.

(b) Draw block diagram of Digital Input/Output module of PLC with its specification.

(c) Classify counter of PLC and explain any one counter function in detail.

(d) State the function of Latching relay using PLC.

(e) Explain block diagram of SCADA. Identify different components of it.

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

(a) Develop control and power circuit for lifting magnet used as a material handling equipment.

(b) Explain the block diagram and function of each part in communication module.

(c) Develop the PLC Ladder Logic for stepper motor control.

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

(a) Describe a generalised DCS architecture.

(b) Draw Ladder diagram for two Motor system with following conditions :

(i) Starting push-button starts Motor-1.

(ii) After 10 sec. Motor-2 is ON.

(iii) Stopping switch stops motor 1 and 2.

(c) Develop the PLC Ladder Logic for water level controller.
