22526

23242

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.

Marks

1. Attempt any FIVE : **5 × 2 = 10**

(a) Explain the concept of NO and NC contact.

(b) Draw the symbol of (i) proximity switch (ii) pressure switch.

(c) List any four advantages of PLC.

(d) Draw ladder diagram for Ex-OR logic gate.

(e) List the types of timer used in PLC.

(f) Draw ladder diagram for DOL starter.

(g) State the function of RTU and MTU w.r.to SCADA.

2. Attempt any THREE : **3 × 4 = 12**

(a) Differentiate between control wiring & power wiring (Any 4 points).

(b) What is opto-isolator ? Explain role of opto-isolator in PLC.

(c) List the types of Counter. Explain Down counter in detail with an example.

(d) Draw ladder diagram for semi-automatic star delta starter.

3. Attempt any THREE : **3 × 4 = 12**

(a) Draw control and power circuit diagram for conveyor control.

(b) Draw a neat block diagram of PLC. Explain function of each block.

(c) Draw a ladder diagram for 3 motor operation for following condition :

(i) Start push button starts motor M_1. After 15 seconds M_2 and M_3 starts.

(ii) Stop push button stops M_3 and after 15 seconds motor M_2 and M_1.

(d) List the types of SCADA system. Explain distributed SCADA system in detail.

4. Attempt any THREE : **3 × 4 = 12**

(a) What is automation ? Explain its need and benefit.

(b) Draw ladder diagram for forward stop reverse control of 3 ϕ IM.

(c) Draw ladder diagram for PLC based water level control with suitable example.

(d) Draw block diagram of AC digital input module & explain the function of each block.

(e) Explain the function of

(1) Communication module

(2) Stepper motor control module

(3) PID conontral module

(4) High speed counter module

5. Attempt any TWO : **2 × 6 = 12**

(a) What is soft starter ? Explain working of soft starter with an example.

(b) Draw ladder diagram for traffic light control system and explain the function of each rung.

(c) Develop a generalized DCS architecture for control of a plant.

6. Attempt any TWO : **2 × 6 = 12**

(a) (i) List the types of memory & explain the function of memory in PLC.

(ii) List the types of PLC based on number of input, output.

(b) Explain the working of PLC based bottle filling system. Draw the ladder diagram for same.

(c) Draw the ladder diagram for :

(1) NOT gate (2) NOR gate (3) OR gate

(4) AND gate (5) NAND gate (6) Ex-NOR gate

Also write truth table for each logic gate.
