22526

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.

Marks

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

(a) Draw the symbol of following :

(i) Push button

(ii) Proximity switch

(iii) Pressure switch

(iv) Limit switch

(b) Draw block diagram of PLC.

(c) List any two input and output device used in conjunction with PLC.

(d) Draw ladder diagram for NAND gate operation.

(e) Give the full form of SCADA and HMI.

(f) Draw ladder diagram of seal in circuit.

(g) Draw ladder diagram of X-OR gate operation.

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

(a) Develop the control circuit for star-delta starter used for starting a 3ϕ induction motor.

(b) Explain with block diagram digital output module of PLC.

(c) Develop ladder diagram and wiring diagram for DOL starter with OLR contact.

(d) Explain the following relay type instruction :

(i) IF-open

(ii) IF close with its symbol

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

(a) Explain Count UP [CTU] instruction with timing diagram.

(b) Distinguish between PLC and SCADA on any four points.

(c) Develop the ladder diagram for ON/OFF temperature control.

(d) Classify timers of PLC and explain retentive ON timer in detail.

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

(a) Draw the ladder diagram for PLC based water level controller.

(b) Classify and explain the PLC available in the market.

(c) Explain with block diagram working of soft starter.

(d) Explain the working of DOL starter control circuit of an induction motor.

(e) Draw the block diagram of analog input module of PLC. State the function of each block.

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

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

(b) Explain the working of PLC based bottle filling system with help of ladder diagram.

(c) Develop control and power circuit diagram of hoist control and mill.

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

(a) Explain instruction T_{ON} and T_{OFF} timer with timing diagram.

(b) Explain the following speciality modules of PLC :

(i) Communication module

(ii) PID controller module

(iii) Stepper motor control module

(c) Develop the ladder diagram for stepper motor control.