11920

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

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

(a) State the need of automation.

(b) Draw the symbol of following :

(i) push button

(ii) limit switch

(iii) proximity switch

(iv) pressure switch

(c) Draw the block diagram of PLC.

(d) Draw and explain ladder diagram for AND operation.

(e) List types of timers.

(f) State the function of seal in circuit w.r.t. PLC.

(g) Give the full form of SCADA & HMI.

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

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

(b) State the functions of PLC memory w.r.t. types, speed of execution.

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

(d) Write the ladder program for 24 hour clock.

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

(a) Explain count up (CTU) instruction with timing diagram.

(b) Develop the ladder diagram for forward-reverse control of a 3 ϕ induction motor.

(c) Explain instructions :

(i) If-closed

(ii) If-open

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

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

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

(b) Explain the working of FWD – STOP – REV control circuit of an induction motor.

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

(d) Explain the function of

(i) Communication module

(ii) PID controller module

(e) Develop ladder and wiring diagram of DOL starter with OLR.

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

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

(b) Develop a generalised DCS architecture for control of a plant.

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

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

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

(b) Explain the instruction T_{on} and T_{off} with timing diagram.

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

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