17664

15116

3 Hours / 100 Marks   Seat No. ☐☐☐☐☐☐☐☐

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.

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

Marks

1. a) **Attempt any THREE of the following:**   **12**

(i) State the benefits of automation (any four).

(ii) Draw labelled diagram of DC input module. Give its specification.

(iii) List different relay type instructions of PLC with symbols.

(iv) Draw a labelled diagram of DC output module and explain it.

b) **Attempt any ONE of the following:**   **6**

(i) 1) Differentiate relay control and PLC control on the basis of reprogramming and speed.

2) What is fixed PLC? Explain.

(ii) Draw a labelled diagram of AC input module and also draw wiring diagram for input device that measures pressure.

Marks

2. **Attempt any <u>TWO</u> of the following:** **16**

a) Name different PLC languages and explain them.

b) Draw a ladder diagram for when start button is pressed pump is switched on. After 20 seconds pump is switched off and heater is switched on. After 10 seconds heater is switched off.

c) Draw a ladder diagram for traffic light control (Assume suitable data).

3. **Attempt any <u>FOUR</u> of the following:** **16**

a) Give the function of following components of PLC:

(i) CPU

(ii) Memory

b) State needs of Automation (four points).

c) Describe with diagram sourcing input module.

d) Describe I/O addressing of PLC.

e) Give the maintenance guidelines of a PLC system.

4. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) Draw the format of ON delay timer with waveforms. Explain each bit of ON delay timer.

(ii) State the different types of speciality I/O modules. Give the details of any two.

(iii) State the types of comparison instruction of a PLC system and give the details of any two.

(iv) State any two precautions when placing PLC in an enclosure.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) Explain the function and organization of RAM and ROM in PLC.

(ii) List any four I/O module selection criteria.

Marks

5. **Attempt any TWO of the following:** **16**

   a) Draw a neat labelled diagram of an AC output module and explain it.

   b) (i) Write a ladder diagram for blinking of a LED.

      (ii) Draw a ladder diagram for two motor operations for following conditions:

         1) Start push button starts motor M1 and motor M2

         2) Stop push button stops motor M1 first then after 15 sec. motor M2

   c) Design a ladder diagram that will control a stepper motor so that it moves 10 steps forward, waits for 20 seconds and moves 10 steps in the reverse direction.

6. **Attempt any FOUR of the following:** **16**

   a) Give redundancy in PLC modules with a neat diagram.

   b) Explain with waveforms up counter.

   c) Why grounding is necessary for PLC during installation?

   d) Give any four data handling instructions with format.

   e) Give the details of troubleshooting in PLC system.

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