17694

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

   (i) List and draw standard electrical signals used for analog inputs.

   (ii) State merits and demerits of PI and PD controller.

   (iii) Draw the block diagram of PLC.

   (iv) State consideration and benefits of SCADA system.

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

   (i) Explain with diagram OFF delay timer. Draw the waveform.

   (ii) Explain the working of Electromagnetic relay with neat sketch.

Marks

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

   a) Explain with diagram sinking and sourcing concept.

   b) Develop a ladder logic for water level control.

   c) Explain with schematic diagram function of control value and VFD.

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

   a) Draw output waveforms for response of different control modes to step, unit, Ramp error inputs.

   b) Draw the block diagram of PLC power supplies. State function of each block.

   c) Explain with diagram and waveform down counter.

   d) Draw SCADA architecture.

   e) Explain basic concept of TCP/IP protocols.

   f) Develop a ladder diagram for standard start - stop seal circuit.

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

     (i) Explain Analog I/O modules and their rating.

     (ii) Develop ladder logic for DOL starter.

     (iii) Explain types of SCADA software.

     (iv) Compare between LAN, MAN, WAN.

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

     (i) Develop a ladder logic for temperature control of oven.

     (ii) Draw block diagram of SCADA in Rail monitoring and control. Explain its working.

Marks

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

a) Draw a ladder diagram for the following:

When start button is pressed motor M_1 is started after 10 sec motor M_2 is started and motor M_1 is stopped. When stop button is pressed motor M_2 is off.

b) List equipments used for SCADA in power distribution. State their function.

c) State the advantage and disadvantage of each RS. 232 / RS. 422 / RS. 485.

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

a) Define memory and list and explain different types of memory.

b) Draw ladder logic for one lamp controlled by two switches.

c) Explain SCADA software types.

d) Explain the concept of communication. State the advantage and disadvantage of serial and parallel communication.

e) Explain selection factors of PLC.

f) Differentiate between Network standards and protocols.

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