

17694

21819

3 Hours / 100 Marks

Seat No.

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- 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. Attempt any FIVE of the following: **20****
- a) Draw the schematic and explain the working of NO and NC contacts.
- b) Explain in brief the concept of power and control wiring
- c) Explain ON/OFF controller and draw its waveform.
- d) List any four advantages of PLC
- e) Draw and explain standard start-stop seal circuit
- f) List any four application of SCADA.
- g) Explain in brief client- server network

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- 2. Attempt any FOUR of the following:** **16**
- a) Compare LAN and WAN (any four point).
 - b) List the types of SCADA software and state their features.
 - c) Develop ladder diagram to control one lamp using two switches.
 - d) Explain digital input modules of PLC.
 - e) Draw the response of PID controller for step and ramp input.
 - f) Draw and explain the working of bimetallic thermal overload relay.
- 3. Attempt any FOUR of the following:** **16**
- a) Explain in brief the concept of VFD.
 - b) State any two merits and two demerits of PI controller.
 - c) Explain the concept of sourcing and sinking wiring in PLC.
 - d) Draw the ladder diagram to verify the truth table of following logic gates:
 - (i) OR gate
 - (ii) EX-OR gate.
 - e) Draw the block diagram of SCADA system used in rail monitoring and control.
 - f) Define network topology. List the different network topologies.
- 4. Attempt any FOUR of the following:** **16**
- a) Compare PI and PID controller (any four points)
 - b) Explain in brief timer/ counter module of PLC.
 - c) Draw the ladder diagram for water level controller (assume suitable data)
 - d) Draw the neat labeled block diagram of SCADA system.
 - e) Compare RS 232 and RS 485 (any four points).
 - f) Draw the bus topology. State its advantages and disadvantages (two each).

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

- a) Explain in brief OSI model of communication.
- b) Explain the role of RTU & MTU in SCADA system.
- c) Explain ON-delay timer and draw its waveform.
- d) Draw the ladder diagram for temperature control of oven (assume suitable data).
- e) Define RAM state its function.
- f) Draw the block diagram of power supply and explain the function of each block.

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

- a) Explain analog output module and state its rating
 - b) Explain in brief down counter of PLC.
 - c) Explain the function of
 - (i) EPROM
 - (ii) PROM
 - d) List any four typical PLC input and outputs.
 - e) Draw the ladder diagram for following logic:
 - (i) When switch 1 is closed lamp L_1 ON.
 - (ii) After 5 sec. delay lamp L_1 is OFF.
 - f) Draw and explain PD controller.
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