

- N.B: (1) Question No. 1 is compulsory.
(2) Attempt any **Three** questions from remaining.
(3) Figures to the right indicate full marks.

1. Answer the following: -

[20]

- a) Explain the different types of plants and controls with examples.
- b) Draw a ladder diagram for a Two – Motor system having following conditions: -
 - i) Starting push button starts Motor-1.
 - ii) After 10 seconds, Motor-2 is ON.
 - iii) Stopping the switch stops Motor -1 and 2.
- c) List any three SCADA vendors with their system.
- d) Explain the duties and tasks of level 4 in hierarchical computer control.

2. a) Design a PLC based automation system for Oven with the following sequence of operation: - [10]

- i) Heater will be ON, when the power switch is activated and door is closed and temperature is below the limit.
- ii) The fan will be ON when the temperature is above the limit and door is closed.
- iii) The light will be ON, if the light switch is ON or whenever the door is open.

Draw the GUI and I/O wiring diagrams. Also show memory calculations.

b) Explain sinking and sourcing output modules of PLC with neat diagram.

[10]

3. a) Explain with block neat diagram, Centralized control system architecture.

[10]

b) Explain the functions and task of supervisory computer in DCS.

[10]

4. a) Explain how SCADA is used for a geographically large area with diagram.

[10]

b) Explain with neat diagram, a system that allows an MTU to store data in central data store.

[10]

5. a) What are the safety standards? Explain IEC 61508 seven-part standard in detail.

[10]

b) What is an Alarm, categories of Alarm, objectives of good Alarm and factor to be considered in the design of Alarm?

[10]

6. Write note on: - (Any Two)

[20]

- a) ERP and typical modules of ERP.
- b) Advanced PLC instructions.
- c) Evolution of DCS.
