

1059

B.E. (Electrical and Electronics Engineering)
Sixth Semester

EE-611: Programmable Logic Controller and Distributed Control System

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) Define SCADA.
- b) What is sourcing and sinking in PLC.
- c) What is automation?
- d) Draw ladder for AND logic.
- e) State and four limitations of DCS. (5x2)

UNIT - I

- II. a) Describe PLC architecture with the help of its functional block diagram.
b) Why is isolation required while connecting input or output devices to the PLC? Explain with suitable diagram how I/O devices can be isolated from PLC. (5,5)
- III. a) List different types of PLC programming languages. Develop ladder diagrams for NAND, NOR and Exclusive OR gates
b) What is scanning in PLC? Draw and explain the scan cycle. (5,5)
- IV. a) Discuss PLC power connection.
b) Explain the concept of holding/latching in PLC ladder diagram. (5,5)

UNIT - II

- V. a) Explain network topology of DCS.
b) Describe the functions of each level of DCS. (5,5)
- VI. a) A timer is to turn on a fan 8.6 seconds after a wall switch is turned On. If the wall switch is turned off during the 8.6 time interval, the timer is to reset to zero seconds, so that when the wall switch is again turns on, the delay is the full 8.6 secs. Construct a ladder diagram for this operation.

P.T.O.

(2)

b) Draw ladder diagram for the following process.

A machine M is to be turned ON either when count A goes upto 11 or when count B goes upto 16. One stop button or switch resets the entire process. (5,5)

VII. a) Draw the ladder diagram for a motor control in forward and reverse directions. Explain the logic in each rung .

b) A temperature control system consists of four thermostats. The system operates three heating units. Thermostats are set at 55, 60, 65 and 70 degrees C. Below 55 degrees C, three heaters are to be ON. A temperature between 55 and 60 degrees C causes two heaters to be ON. For 60 to 65 degrees, one heater is to be ON. Above 70 degrees C , there is a safety shutoff for all three heaters in case one stays on by mistake. A master switch turns the system On and Off. Construct a PLC system. (5,5)

x-x-x