Exam. Code: 0936
Sub. Code: 33774

2015

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. I which is compulsory and selecting two questions from each Section.***

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Q 1 (5x2)

a) Define SCADA.
b) What is sourcing and sinking in PLC.
c) What are the components of a PLC.
d) State four pieces of information usually associated with a PLC counter instruction.
e) Draw ladder for OR logic.

Section A

Q 2

a) Describe PLC architecture with the help of its functional block diagram . (5)
b) List different types of PLC programming languages. Develop ladder diagrams for NAND, NOR and Exclusive OR gates . (5)

Q 3

a) Explain any two addressing schemes used in PLC's. (5)
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)

Q4

a) Discuss PLC power connection. (5)

b) Draw the connection diagram and ladder program for a motor control in forward and reverse direction with interlocking. (5)

Section B

Q 5

a) Explain network topology of DCS. (5)
b) Describe the functions of each level of DCS. (5)

P.T.O.

Q 6

a) Draw ladder diagram for the following process (5)
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.

a) Write a program that will increment a counter's accumulated value 1 count every 60 s. A second counter's accumulated value will increment 1 count every time the first counter's accumulated value reaches 60. The first counter will reset when its accumulated value reaches 60, and the second counter will reset when its accumulated value reaches 12. (5)

Q 7

a) There are three machines, each with its own start stop buttons. Only one may run at a time. Construct a ladder diagram with appropriate interlocking. (5)

b) A temperature control system consists of four thermostats. The system operates three heating units. Thermostats are set at 55,60,65and 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)

x-x-x