Exam.Code:0936
Sub. Code: 6719

2054

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 Unit

x-x-x

I. Attempt the following:-

a) State any four selection criteria of PLC.

b) List out the different types of PLC programming languages.

c) List different network topology used for DCS.

d) Define Scan type of PLC.

e) What is sourcing and sinking in PLC. (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. (2x5)

III. a) Discuss the various types of volatile and non-volatile memory.

b) It is required to have a pilot light come on when all of the following circuit requirements are met:

i) All four circuit pressure switches must be closed.

ii) At least two out of three circuit limit switches must be closed.

iii) The reset switch must not be closed.

iv) Using AND, OR, and NOT gates, design a logic circuit that will solve this problem. (2x5)

IV. a) There are three water pump motors. At any time only one motor will run. Draw its PLC ladder logic with appropriate interlocking.

b) Explain in detail the factors responsible for difficulties encountered in implementation of process control. (2x5)

P.T.O.

UNIT - II

V. 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.

b) There are three part conveyor lines (1-2-3) feeding a main conveyor. Each of the three conveyor lines has its own counter. Construct a PLC program to obtain the total count of parts on the main conveyor. b. Add a timer to the program that will update the total count every 30 s. (2x5)

VI. Design a PLC program and prepare a typical I/O connection diagram and ladder logic program for the following counter specifications:

a) Counts the number of times a pushbutton is closed.

b) Decrements the accumulated value of the counter each time a second pushbutton is closed.

c) Turns on a light anytime the accumulated value of the counter is less than 20.

d) Turns on a second light when the accumulated value of the counter is equal to or greater than 20.

e) Resets the counter to 0 when a selector switch is closed. (10)

VII. a) When the lights are turned off in a building, an exit door light is to remain on for an additional 2 min, and the parking lot lights are to remain on for an additional 3 min after the door light goes out. Write a program to implement this process.

b) What is DCS? How does it differ from SCADA. Discuss the various levels of DCS. (2x5)

x-x-x