Exam. Code: 0936
Sub. Code: 6677

2054

B.E. (Electrical and Electronics Engineering)

Sixth Semester

PC-EE-603: Programmable Logic Controllers

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. Answer the following:-

a) Define a Programmable Logic Controller (PLC) and describe its advantages over traditional control systems.

b) Explain the concept of retentive timers and how they differ from ON-delay and OFF-delay timers.

c) Describe the criteria for selecting a PLC for industrial applications.

d) Explain the basic structure of a ladder diagram and its significance in PLC programming.

e) In what way are timers and counters different? (5x2)

UNIT-I

II. One open tank is installed in the plant of which liquid level is to be controlled. When level reaches the Level Low, Outlet flow is blocked and inlet flow is allowed until high level is achieved. And when Level High is detected, outlet flow is allowed and inlet flow is blocked. Develop an appropriate ladder logic. (10)

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

a) Three starters are to be wired so that each starter is operated from its own start/stop pushbutton station.

b) A master stop station is to be included that will trip out all starters when pushed.

c) Overload relay contacts are to be programmed so that an overload on any one of the starters will automatically drop all of the starters.

d) All pushbuttons are to be wired using one set of NO contacts. (10)

IV. Why isolation is required while connecting input or output devices to the PLC? Explain with suitable diagrams how I/O devices can be isolated from PLC. (10)

P.T.O.

UNIT - II

V. A classroom has a capacity of maximum 120 students. There are two doors, one for Entry and the other for Exit. When number of students in the classroom is less than 120, Entry door has a Green light on it which remains ON. When number of students in the classroom is 120 or more than that, Red light goes ON turning OFF the Green light which indicates that the classroom has reached its maximum capacity and is full. How will you implement this process. (10)

VI. 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. (10)

VII. Provide an overview of SCADA and DCS systems, highlighting their key functions, network topologies, and advantages and disadvantages in industrial automation. (10)

x-x-x