



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; August - 2023

Programmable Logic Controller and SCADA

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Understanding the basics of programmable logic controllers its hardware and architecture.

CO2: Analyzing signal processing and applications of PLC.

CO3: Describing PLC programming techniques.

CO4: Analyzing Timers, counters and shift registers programming.

CO5: Understanding Data handling and SCADA Systems.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
1 a.	Define sourcing and sinking.	2	L1	CO1	PO1
b.	Explain how signal conditioning can be done using potential divider circuit?	2	L1	CO2	PO1
c.	Write AND and OR logic in ladder diagram.	2	L1	CO3	PO1
d.	Differentiate between timer and counter.	2	L1	CO4	PO1
e.	Write any four applications of SCADA.	2	L1	CO5	PO1
II : PART - B		90			
UNIT - I		18			
2 a.	With a neat block diagram, explain the internal architecture of a PLC.	9	L2	CO1	PO1
b.	Define sensor and explain the terminologies to define the performance of sensors.	9	L2	CO1	PO1
c.	Explain the working of flowing sensor:				
	i) Photo electric sensors	9	L2	CO1	PO1
	ii) Proximity sensor				
UNIT - II		18			
3 a.	Explain working of conveyor belt and also write a ladder program for it.	9	L3	CO2	PO3
b.	List the necessity of signal conditioning. Also explain the signal conditioning with strain gauge sensor.	9	L2	CO2	PO1
c.	With a neat diagram, explain serial communication standard and name the connector used with main pin configuration.	9	L2	CO2	PO1

UNIT - III**18**

- 4 a. With an example, illustrate the latching circuit. 9 L3 CO3 PO3
- b. Explain the importance of location of stop switches and emergency in motor stop application. 9 L3 CO3 PO3
- c. Write a program for two way control of lamp using;
- i) Ladder program
 - ii) Instruction list 9 L3 CO3 PO3
 - iii) Sequential function chart
 - iv) Structured text

UNIT - IV**18**

- 5 a. With an example, explain the working of on-delay and off-delay timer in PLC. 9 L3 CO4 PO3
- b. Illustrate the working of up counter and write a program to stop a motor from running after 10 counts using counter. 9 L2 CO4 PO3
- c. With neat diagram, explain the working of drum sequencer. 9 L2 CO4 PO2

UNIT - V**18**

- 6 a. Explain the role of SCADA in automation of industries. 9 L2 CO5 PO1
- b. Explain features and applications of master terminal unit and remote terminal unit of SCADA. 9 L4 CO5 PO2
- c. With an example, explain the working of data movement and data comparison instructions. 9 L3 CO5 PO3

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