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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; July / Aug. - 2022
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.*

<u>Note:</u> I) PART - A is compulsory. **Two** marks for each question.

II) PART - B: Answer any <u>Two</u> 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**			
I a.	How much is 1 GB of memory?	2	L1	CO1	PO1
b.	Enlist i/o devices used in PLC.	2	L1	CO2	PO1
c.	A signal lamp is required to be switched ON if a pump is running and the pressure is satisfactory or if pump test switch is closed. Draw the ladder diagram.	2	L1	CO3	PO1
d.	Enlist various types of timers.	2	L1	CO4	PO1
e.	Enlist any four application of SCADA.	2	L1	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Describe PLC. Explain the need of PLC in automation by enlisting advantages of it.	9	L2	CO1	PO1
b.	Explain internal architecture of PLC with a neat block diagram.	9	L2	CO2	PO2
c.	Describe the IEC standard for complete life cycle of PLC	9	L2	CO1	PO2
	UNIT - II	**18**			
2 a.	With diagram explain ISO/OSI network model.	9	L2	CO2	PO2
b.	Explain the serial standards for effective communication by describing serial communication.	9	L3	CO2	PO1
c.	Explain the application of PLC in liquid level monitoring and conveyor belt system.	9	L1	CO2	PO1

UNIT - III		**18**			
3 a.	Realize NAND, NOR and XOR logic gates using ladder diagram and functional block diagram.	9	L3	CO3	PO2
b.	Explain the conventions adopted in drawing ladder diagram.	9	L4	CO3	PO2
c.	Draw the ladder diagram and explain the following relays:				
	i) Battery backed	9	L3	CO3	PO3
	ii) SET and RESET				
UNIT - IV		**18**			
4 a.	Explain various types of timers with ladder diagram.	9	L2	CO4	PO3
b.	Describe sequencer. Explain how sequencer logic is implements in ladder diagram.	9	L2	CO2	PO2
c.	Explain up-down counting with ladder diagram.	9	L2	CO2	PO2
UNIT - V		**18**			
5 a.	Discuss the following:				
	i) Need of SCADA in automation	9	L4	CO5	PO2
	ii) MTU and RTU				
b.	Explain the role of SCADA in automation of industries.	9	L2	CO5	PO1
c.	With block diagram explain SCADA architecture.	9	L2	CO5	PO1

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