U.S.N

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

∗ ∗ ∗ ∗