Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 09- 12-2025 **Time:** 01:00pm – 04:00pm

School: SOE	**Program:** B. Tech - EEE	
Course Code: EEE3015	**Course Name:** Industrial Automation with PLC and SCADA	
Semester: VII	**Max Marks**: **100**	**Weightage**: **50%**

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	**14**	**24**	**19**	**19**	**24**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

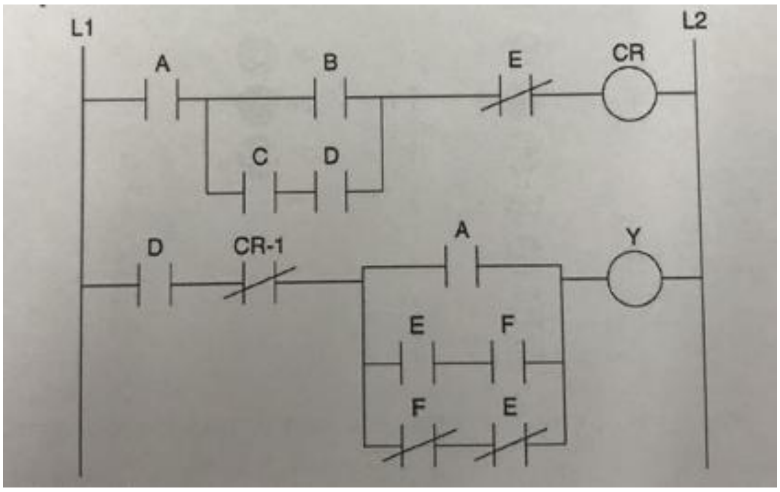
Part A

Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M

1.	Outline the advantages and disadvantages of PLC	**2 Marks**	**L2**	**CO1**
2.	Explain I/O sourcing and sinking in PLC.	**2 Marks**	**L2**	**CO1**
3.	Illustrate the following Boolean equation using functional block diagram and ladder diagram. (A.B.C) +(C.D)= Q.	**2 Marks**	**L3**	**CO2**
4.	A signal lamp is required to be switched ON, if a pump is running and pressure is satisfactory or if the lamp test switch is closed. Construct ladder diagram and gate diagram.	**2 Marks**	**L3**	**CO2**
5.	Explain the role of PLC in SCADA systems.	**2 Marks**	**L2**	**CO3**
6.	Illustrate the IEC61131 PLC standard.	**2 Marks**	**L2**	**CO3**
7.	Outline the SCADA contribute to building facilities management	**2 Marks**	**L2**	**CO4**
8.	List two benefits of using SCADA in oil and gas industries	**2 Marks**	**L3**	**CO4**
9.	Classify the difference between SCADA and DCS	**2 Marks**	**L3**	**CO5**
10.	List the power system states in INDIA	**2 Marks**	**L3**	**CO5**

Part B

		Answer the Questions.	**Total Marks 80M**		
11.	**a.**	Describe with a neat diagram of PLC with a hardware details.	**10 Marks**	**L1**	**CO1**
Or					
12.	**a.**	Construct the ladder diagrams for the following logic functions: a) AND b) OR c) NAND d) NOR.	**10 Marks**	**L1**	**CO1**

13.	**a.**	Illustrate the given PLC ladder diagram in to gate diagram and write Boolean equation for the same. 	**10 Marks**	**L3**	**CO2**
Or					
14.	**a.**	There are three hazardous inputs the alarm system that goes on as some malfunction occurs. The system operates as follows: If any one of the input is on, red pilot light goes on, If any two of the inputs are on, an alarm siren sounds, If all the three inputs are on, fire department is notified and an alert light glows. Draw the ladder diagram and functional block diagram.	**10 Marks**	**L3**	**CO2**

15.	**a.**	Sketch the ladder diagram for a motorized overhead garage door is to be operated automatically to preset open and closed positions. The field devices include one of each of the following • Reversing motor contactor for up and down directions, • Normally closed down limit switch to sense when the door is fully closed • Normally Closed up limit switch to sense when the door is fully opened. • Normally open door up button for the up direction. • Normally open door down button for the down direction. • Normally closed door stop button for stopping the door. • Red door ajar light to signal when the door is partially open.	**10 Marks**	**L3**	**CO2**

		• green door open light to signal when the door is fully open. • yellow door closed light to signal when the door is fully closed.			
Or					
16.	**a.**	Classify the role of PLC programming languages in industrial automation, with examples.	**10 Marks**	**L3**	**CO2**

17.	**a.**	Examine the configuration and programming of DCS, including its specifications and requirements.	**15 Marks**	**L3**	**CO3**
Or					
18.	**a.**	Illustrate the IEC61131 international standard for PLC programming, highlighting its significance.	**15 Marks**	**L3**	**CO3**

19.	**a.**	Analyze the communication networks used in SCADA systems, highlighting their advantages and limitations.	**15 Marks**	**L4**	**CO4**
Or					
20.	**a.**	Outline the applications of SCADA in oil and gas industries, including pipeline monitoring and control.	**15 Marks**	**L4**	**CO4**

21.	**a.**	Develop the SCADA systems improve efficiency in industrial processes with example.	**20 Marks**	**L5**	**CO5**
Or					
22.	**a.**	Prepare the role of SCADA systems in water treatment and distribution	**20 Marks**	**L5**	**CO5**