Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 24-05-2025 **Time:** 09:30 am – 12:30 pm

School: SOCSE	**Program:** B. Tech- CAI\CBC\CBD\CCS\CDV\CIT\COM\ CSD\CSE\CSG\ISE\IST	
Course Code: EEE1004	**Course Name:** Fundamentals of Industrial Automation	
Semester: VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**24**	**26**	**26**	**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**

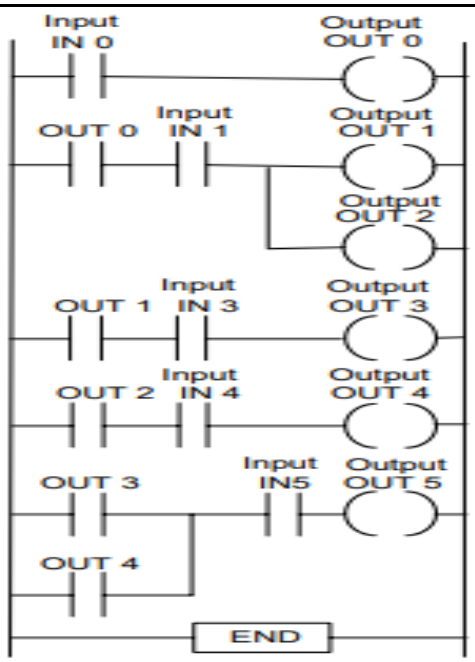
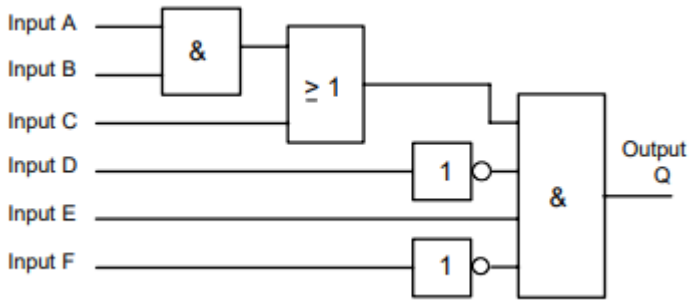
1.	List the advantages of Programmable Logic Controllers	**2 Marks**	**L1**	**CO1**
2.	Define the terms accuracy and sensitivity for the sensors	**2 Marks**	**L1**	**CO1**
3.	How an NOT and AND gates are realized using ladder diagram?	**2 Marks**	**L1**	**CO2**
4.	Recall the basic syntax rule applied to Structured text programming language (STL)	**2 Marks**	**L1**	**CO2**
5.	List the various PLC Programming Methodologies used in Industrial automation	**2 Marks**	**L1**	**CO2**
6.	List the functions of SCADA in industrial automation	**2 Marks**	**L1**	**CO3**
7.	What are the various wireless communication technologies available in SCADA?	**2 Marks**	**L1**	**CO3**
8.	List the important features of SCADA systems	**2 Marks**	**L1**	**CO3**
9.	What is a Distributed Control System?	**2 Marks**	**L1**	**CO4**
10.	Define the term batch processing	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	The primary objective of PLC integration is to enhance the efficacy and efficiency of industrial automation processes. PLCs are extensively used in manufacturing, process control, and building automation systems, and their integration can lead to increased productivity, decreased downtime, and improved product quality. Summarize the requirements to integrate PLC with plant systems and equipment	10 Marks	L2	CO1
	b.	Industrial temperature sensor technology enables targeted, highly accurate ongoing monitoring of equipment and component temperatures with real-time communication to facilitate immediate response to potential problems. Explain various temperature sensors used in the industry that can be integrated with PLCs	10 Marks	L2	CO1
		Or			
12.	**a.**	Photoelectric Sensors can be used in many different ways and industries. For example, they can be used to detect objects or the orientation of an object on a production line, they can be used to count, and they can also be used to stop an automatic closing door. Explain various types of photo electric sensors used in the industry for automation	10 Marks	L2	CO1
	b.	A programmable logic controller (PLC) is an industrial grade computer that is capable of being programmed to perform control functions. PLC has eliminated much of the hardwiring associated with conventional relay control circuits. Explain the differences between PLC and Relay logic.	10 Marks	L2	CO1

13.	**a.**	Ladder logic is a fast and simple way of creating logic expressions for a PLC in order to automate repetitive machine tasks and sequences. It is used in a multitude of industrial automation applications. With neat sketch explain the various components and conventions used in the Ladder Logic diagram	10 Marks	L2	CO2
	b.	For the ladder diagram shown below, construct the SFC	10 Marks	L3	CO2

					
Or					
14.	**a.**	Explain the Sequential Flow Chart Programming in PLC. With neat sketch explain selective branching and parallel branching in SFC - PLC programming.	**10 Marks**	**L2**	**CO2**
	b.	For the functional block diagram given below, develop the ladder diagram and the instruction list 	**10 Marks**	**L3**	**CO2**

15.	**a.**	SCADA systems are crucial for industrial organizations since they help to maintain efficiency, process data for smarter decisions, and communicate system issues to help mitigate downtime. Summarize the examples of SCADA applications.	**10 Marks**	**L2**	**CO3**
	b.	A SCADA system with a multi-channel data acquisition system is a powerful tool for industrial automation, providing real-time monitoring, control, and analysis. With neat sketch explain the Multi Channel Data Acquisition System.	**10 Marks**	**L2**	**CO3**
Or					
16.	**a.**	Explain various Monitoring and Supervisory Functions performed by SCADA systems	**10 Marks**	**L2**	**CO3**

	b.	Explain the various communication technologies used in SCADA and the factors influencing technology choice	**10 Marks**	**L2**	**CO3**

17.	**a.**	With neat sketch explain the configuration of Distributed Control Systems	1**0 Marks**	**L**2	**CO**4
	b.	With neat sketch explain the concept of Advanced process control	**10 Marks**	**L2**	**CO4**
		Or			
18.	**a.**	Summarize the methods of Security and Access Control in Industrial Automation	**10 Marks**	**L2**	**CO4**
	b.	Explain the concept of Historical data management in industrial automation. Also summarize the various tools and technologies available for Historical data management.	**10 Marks**	**L2**	**CO4**