Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3151109 Date: 23/06/2023

Subject Name: Industrial Automation

Time: 02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	(a)	Explain Need and advantages of Automation.	03
	(b)	What is robot? & Explain Basic construction and configuration of robots.	04
	(c)	What do you mean by SCADA system? Explain basic SCADA architecture and typical features.	07
Q.2	(a)	Explain features and advantages of DCS systems.	03
	(b)	What are difference between modbus & profibus ?	04
	(c)	Draw the architecture of PLC and explain each block in detail.	07
		OR	
	(c)	Enlist types of flow meters. Explain any one in detail.	07
Q.3	(a)	Explain any one displacement transducer with neat diagram.	03
	(b)	Differentiate Power MOSFET & IGBT.	04
	(c)	What is sensor & Actuator? List various types of sensor & Explain construction and operation of Resistance thermometer.	07
		OR	
Q.3	(a)	What are general rules to be followed during PLC installation?	03
	(b)	Explain the basic principle of pH measurement with neat diagram.	04
	(c)	Explain the basic principle of Mechanical Tachometers used for the speed measurement. Explain any two in detail with neat diagrams.	07
Q.4	(a)	What do you mean by IoT? How it is useful in industrial automation?	03
	(b)	What is ladder diagram? State symbols with their description used in ladder diagram.	04
	(c)	Develop a PLC ladder diagram for ON-OFF operation of Motor by using 1. START-NO; STOP-NO push buttons. 2. START-NC; STOP-NC push buttons.	07
		OR	
Q.4	(a)	Explain basic distributed control system.	03
	(b)	Discuss about the various types of displays that can be achieved using DCS for efficient monitoring of plant parameters.	04
	(c)	Explain the hydraulic servos with neat diagram.	07
Q.5	(a)	Explain Scan cycle of PLC?	03
	(b)	Explain use of solenoid as an electrical actuator.	04
	(c)	What do you mean by pick and place robot? With the help of simple block diagram explain its parts and working in brief.	07
		OR	
Q.5	(a)	Explain the benefits of computers in measurements and control.	03
	(b)	Give overview of Industry 4.0.	04
	(c)	Write short note on AC & DC drive.	07