Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3170925 Date:03/06/2022

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)	Explain any one Displacement Transducer with neat diagram.	**04**
	(c)	Draw the architecture of PLC and explain each block in in detail.	**07**
Q.2	**(a)**	Explain elements of ladder diagram and its application.	**03**
	(b)	What do you mean by (i) MODBUS (ii) PROFI-BUS.	**04**
	(c)	What is Automation and explain different types of automation systems.	**07**
		OR	
	(c)	List the different types of speed-measuring devices. Explain with neat sketches the construction and working of any two of them.	**07**
Q.3	**(a)**	Differentiate power MOSFET and IGBT.	**03**
	(b)	Explain construction and operation of magnetic flow meter with diagram.	**04**
	(c)	Develop a ladder diagram to start a motor using DOL starter with following point. Also Draw its control circuit diagram. 1. When Start push button (PB1) is pressed, Motor (M1) has to start. 2. If Start push button (PB1) is released and Stop pushbutton (PB2) is not pressed, Motor (M1) should remain on. 3. When Stop push button (PB2 is pressed, Motor (M1) has to stop. 4. If stop push button is released and start is not pressed (released) motor should remain off.	**07**
		OR	
Q.3	**(a)**	Explain the function RTD.	**03**
	(b)	How pH measurement is done? Explain it in brief.	**04**
	(c)	Develop a ladder diagram to make AND logic and OR logic with Boolean expression and circuit diagram.	**07**
Q.4	**(a)**	Explain features and advantages of DCS systems.	**03**
	(b)	Explain the benefits of computers in measurements and control	**04**
	(c)	Discuss about the various types of displays that can be achieved using DCS for efficient monitoring of plant parameters.	**07**
		OR	
Q.4	**(a)**	Write the difference between PLC & DCS.	**03**
	(b)	Explain in detail the input-output module used in PLC.	**04**
	(c)	What do you mean by SCADA system? Discuss basic architecture and typical features of SCADA.	**07**

Q.5	**(a)**	What do you mean by IoT? How it is useful in industrial automation?	**03**
	(b)	Explain benefit of using PLC for industrial applications. Explain disadvantage of PLC over other microcontroller.	**04**
	(c)	Explain Pick and place robot in brief.	**07**

OR

Q.5	**(a)**	Explain the major configurations of Industrial Robots.	**03**
	(b)	What is robot? & Explain Basic construction and configuration of robots.	**04**
	(c)	Explain Welding robot in brief.	**07**

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