Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3151109 Date:02/06/2022

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)**	What is automation & list its advantage & disadvantage.	**03**
	(b)	Explain four major configurations of Industrial Robots.	**04**
	(c)	What do you mean by SCADA system? Explain basic SCADA architecture and typical features.	**07**
Q.2	**(a)**	Explain in brief (i) PROFI-BUS (ii) MODBUS	**03**
	(b)	What are the various types of filled-type temperature measurements? Explain any one in detail.	**04**
	(c)	Explain the construction and working principle of Electromagnetic Flow Meter with advantages and disadvantages.	**07**
		OR	
	(c)	List standard interface available in automation & Compare RS232 & RS485 interface.	**07**
Q.3	**(a)**	Explain Scan cycle of PLC.	**03**
	(b)	What is ladder diagram? State symbols with their description used in ladder diagram.	**04**
	(c)	Discuss in brief about the various types of information display that can be used with DCS for efficient monitoring of plant parameters.	**07**
		OR	
Q.3	**(a)**	Explain important characteristics for the selection of PLC.	**03**
	(b)	Explain in detail the input-output module used in PLC.	**04**
	(c)	Compare relative features of twisted pairs, coaxial cables and fiber optic cable for DCS highway.	**07**
Q.4	**(a)**	Short note on : PH measurement	**03**
	(b)	What do you mean by actuators? Explain stepping motor with neat diagram.	**04**
	(c)	Write short note on AC & DC drive.	**07**
		OR	
Q.4	**(a)**	Explain any one displacement transducer with neat diagram.	**03**
	(b)	List the different types of speed-measuring devices. Explain the construction and working of optical encoder with necessary diagram.	**04**
	(c)	Explain construction, working of SCR. Explain power control circuit using SCR & DIAC with waveforms.	**07**
Q.5	**(a)**	Write a short note on Human Machine Interface (HMI).	**03**
	(b)	What is IOT? List advantage of IOT in industry.	**04**
	(c)	Write PLC ladder diagram program for following application:	**07**

In a food process plant when start switch is pressed Motor 1 and 2 turns ON for 5 and 10 sec, motor 3 and 4 turns on after 5 and 10 sec.

OR

Q.5	**(a)**	Draw the block diagram of PLC.	**03**
	(b)	Explain pick and place robot with the help of simple block diagram.	**04**
	(c)	Make ladder logic program for following application: There is a selector switch s1, one "start" button and one "stop" button. IF S.S pressed once along with start button then motor 1 must be ON. If S.S is pressed two times along with start then motor 2must be ON. If S.S is pressed three times along with start motor 3 must be ON. IF S.S pressed one time along with stop button then motor 1 must be OFF. If S.S is pressed two times along with Stop then motor 2 must be OFF. If S.S is pressed three times along with Stop motor 3 must be OFF.	**07**

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