Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3170925   **Date:14-12-2023**
Subject Name: Industrial Automation
Time: 10:30 AM TO 01:00 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? Explain in details Components of Industrial automation.	**03**
	(b)	Describe the different components and applications of PLC.	**04**
	(c)	Draw and explain the generalized block diagram of Industrial Instrumentation system.	**07**
Q.2	**(a)**	Distinguish between a transducer and a sensor.	**03**
	(b)	Draw the layouts of PLC input and output modules and explain each in detail.	**04**
	(c)	List out & explain in detail the sensors for temperature, pressure, force, displacement, speed & flow.	**07**
		OR	
	(c)	Draw the timing diagram of retentive timer. Draw the timing diagram and write PLC ladder logic equivalent of ON Delay and Dual OFF Delay timer.	**07**
Q.3	**(a)**	Compare PLC and DCS system.	**03**
	(b)	Explain advantage and Limitation of DCS	**04**
	(c)	Draw and explain the PLC ladder diagram for automatic bottle filling plant. (Figure-2)	**07**
		OR	
Q.3	**(a)**	Define Relay Logic and PLC.	**03**
	(b)	Compare between Modbus and Profibus.	**04**
	(c)	Draw and explain the PLC ladder diagram for automatic Traffic Control Lights. (Figure-1)	**07**
Q.4	**(a)**	Define PLC and SCADA System.	**03**
	(b)	List out advantages & disadvantages of PLC for Industrial automation.	**04**
	(c)	Define SCADA systems. Explain in details SCADA systems.	**07**
		OR	
Q.4	**(a)**	List out & explain any one about various programming languages used in PLC.	**03**
	(b)	Define term DCS. List at least Six applications of DCS.	**04**
	(c)	Draw and explain the ladder diagram & module wiring for water level controller. (Figure-3)	**07**
Q.5	**(a)**	Explain the basic construction and configuration of robot for industrial applications.	**03**

(b) Discuss the difference between AC Servo Motor and DC Servo Motor. **04**

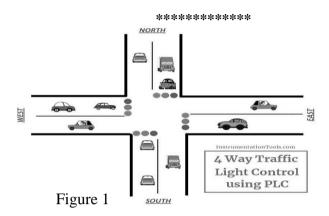**(c)** Draw and explain the major components of Internet of things in industrial automation. Also list out its application. **07**

OR

Q.5 (a) Discuss about software configuration of DCS. **03**

(b) What is Industry4.0 revolution? **04**

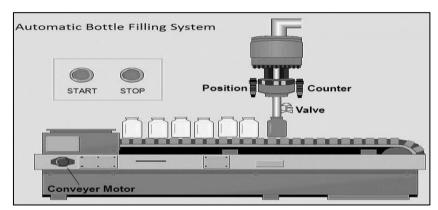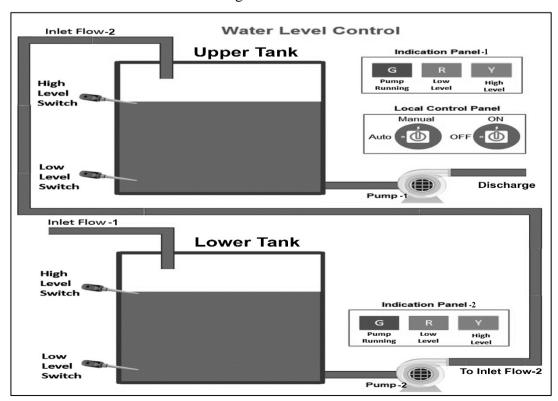**(c)** Discuss the significance and application of pick and place and welding robots for industrial applications. **07**

****

Figure 1

Figure 2

Figure 3