

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3170925****Date:13/12/2021****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) Define Automation and its role in process 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) List out the various sensors used for pressure measurement.	03
	(b) Explain the role of Power MOSFET and IGBT in Automation system.	04
	(c) Identify the different types of transducers used for temperature measurement. Distinguish between their suitability for different temperature ranges.	07
	OR	
	(c) Discuss the construction, working principle and application of LVDT.	07
Q.3	(a) Discuss the difference between fixed and modular PLCs.	03
	(b) Give brief overview idea about PLC Communication and networking in Industrial Automation.	04
	(c) Explain the function of Actuators in process industries with suitable example.	07
	OR	
Q.3	(a) List out the difference between analog and discrete I/O in PLC based system.	03
	(b) Compare between Modbus and Profibus.	04
	(c) Draw and explain the PLC ladder diagram for Star delta Starter.	07
Q.4	(a) List out about various programming languages used in PLC.	03
	(b) How PLC communicates with field Instruments and SCADA?	04
	(c) Explain the function of On Delay and Off Delay Timers in PLC Programming with suitable example.	07
	OR	
Q.4	(a) Distinguish between SCADA and DCS with reference to different applications in Industrial Automation System.	03
	(b) How PLC's are selected for different applications?	04
	(c) Draw the block diagram of DCS along with its features and advantages.	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**

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.	07
	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.	
	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**
