

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2021****Subject Code:3151109****Date:07/09/2021****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.

		<b>Marks</b>
<b>Q.1</b>	(a) What is automation & list its advantage & disadvantage.	<b>03</b>
	(b) What is robot? & Explain Basic construction and configuration of robots.	<b>04</b>
	(c) Explain the basic principles of servo systems. Enlist types of DC servo motors with neat diagram.	<b>07</b>
<b>Q.2</b>	(a) What is a PLC? Draw block diagram of PLC. Explain each block in detail.	<b>03</b>
	(b) Explain in brief (i) PROFI-BUS (ii) MODBUS	<b>04</b>
	(c) Write short note on AC & DC drive.	<b>07</b>
<b>OR</b>		
	(c) Explain DIAC in detail	<b>07</b>
<b>Q.3</b>	(a) What are general rules to be followed during PLC installation?	<b>03</b>
	(b) Explain Industry 4.0 in detail.	<b>04</b>
	(c) List the different types of speed-measuring devices. Explain the construction and working of any two of them with necessary diagram.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What is IOT? List advantage of IOT in industry.	<b>03</b>
	(b) Differentiate Power MOSFET & IGBT.	<b>04</b>
	(c) Discuss in brief about the various types of information display that can be achieved using DCS for efficient monitoring of plant parameters.	<b>07</b>
<b>Q.4</b>	(a) Explain basic construction and configuration of pick and place robot.	<b>03</b>
	(b) Enlist various automation systems and explain any two in details.	<b>04</b>
	(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.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Explain Scan cycle of PLC?	<b>03</b>
	(b) Explain any one Displacement Transducer with neat diagram	<b>04</b>
	(c) Draw and explain basic architecture of distributed control system.	<b>07</b>
<b>Q.5</b>	(a) How pH measurement is done? Explain it in brief.	<b>03</b>
	(b) Briefly explain as how software configuration is performed in DCS system.	<b>04</b>
	(c) What is sensor & Actuator? List various types of sensor & Explain construction and operation of Resistance thermometer.	<b>07</b>

**OR**

- Q.5**
- (a)** Explain features and advantages of DCS systems. **03**
  - (b)** What do you mean by SCADA system? Discuss basic Architecture and typical features of SCADA. **04**
  - (c)** Explain use of solenoid as an electrical actuator. How it is used to change gears? **07**