

Enrollment No./Seat No.:

## GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

**Subject Code: 3151109**

**Date: 17-11-2025**

**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 (a)</b> State the role of computers in measurement and control.	<b>03</b>
(b) Compare PLC and SCADA used in industries	<b>04</b>
(c) Describe the role of power electronics for industrial automation.	<b>07</b>
<b>Q.2 (a)</b> What is sensor? List out sensors used for temperature measurement with technical specification .	<b>03</b>
(b) Discuss the application of process control valve	<b>04</b>
(c) What is communication protocol.? Explain in details about communication protocol used in industrial automation	<b>07</b>

### OR

<b>(c)</b> What is an automation? Explain the Industrial automation system with block diagram	<b>07</b>
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<b>Q.3 (a)</b> Draw the ladder diagram for 2-inputs OR gate	<b>03</b>
(b) Describe the use of IGBT in industrial automation system.	<b>04</b>
(c) Draw and explain architecture of PLC for an industrial automation system .	<b>07</b>

### OR

<b>(a)</b> Sketch the ladder diagram for 2 input Ex-OR gate	<b>03</b>
(b) Enlist various types of actuators used in industry with their technical specification	<b>04</b>
(c) What is DCS ? Give its functionality .How does a DCS handle complex control loops in large industrial plants.	<b>07</b>
<b>Q.4 (a)</b> Mention the working and operational principle of any one pressure sensor .	<b>03</b>
(b) Enlist in detail about requirement in process of PLC installation.	<b>04</b>
(c) How does the Internet of things enable the automation and what are the components that makes this possible ?	<b>07</b>

### OR

(a) Describe the application of motion sensor in AC servo drive used in industry **03**

(b) Write a short note on : Sequential flow chart **04**

(c) How pick and place robot works for industrial automation system ? **07**

**Q.5** (a) Write short note on : Overview of industry 4.0 for automation **03**

(b) How DCS integrates with PLC and computers ? **04**

(c) Explain about ladder diagram used in PLC programming. Mention its advantages and disadvantages **07**

**OR**

(a) " welding robot is worth investment " justify **03**

(b) Discuss the parameters and fundamentals to chose PLC for industrial application **04**

(c) What is SCADA? Draw and explain the SCADA system used in industrial automation with necessary block diagram **07**

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