

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3151109

Date: 21/05/2026

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.**

- Q.1**
- (a) What is MODBUS ? Give its TCP/IP structure. **03**
 - (b) what is Automation ? what are the basic requirement of automation? **04**
 - (c) what is DIAC and TRIAC role in industrial Automation system ? **07**
- Q.2**
- (a) How AC servo drive works for motion control in industry? Explain in detail . **03**
 - (b) which sensors are used to measure humidity in industry ? How it works ? **04**
 - (c) Give comparison between IGBT and MOSFET ? Give the application of MOSFET and IGBT in industry **07**
- OR
- Q.2**
- (c) Explain the working of displacement sensor with suitable industrial application example . **07**
- Q.3**
- (a) what is ladder diagram? give its significance . **03**
 - (b) What are the points to be considered in PLC selection? **04**
 - (c) How DCS can be integrated with PLC and computer ? Explain. **07**
- OR
- Q.3**
- (a) What is sequential flow chart for PLC ? **03**
 - (b) List out all types of temperature sensors used in industry with typical range of temperature measurement **04**
 - (c) Explain SCADA system used in industrial automation system with necessary block diagram. **07**
- Q.4**
- (a) Draw ladder diagram for 2 input AND gate and 2 input OR gate . **03**
 - (b) Explain the working principle of Flow sensor. **04**
 - (c) Explain DCS system with block diagram. Give the advantages of DCS system **07**
- OR
- Q.4**
- (a) Draw the ladder diagram for Ex-OR gate **03**
 - (b) Explain the concept of Pick and place robot **04**
 - (c) What is IoT ? Give advantages of IoT based system over traditional system **07**
- Q.5**
- (a) Write Short note : Role of computers in industrial automation **03**
 - (b) Write basic construction detail of ROBOT **04**

(c) what you imagine for Industry 4.0 ? Explain in detail with its advantages **07**

OR

Q.5 (a) Write short note on : welding robot for industrial automation **03**

(b) Compare PLC and SCADA system used in industrial automation system **04**

(c) Explain How communication in DCS system works with necessary path flow and diagram. **07**
