

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code:3162421

Date:01-06-2026

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.

- Q.1** (a) Define automation. Discuss the needs met by automation. **03**
(b) Explain the types of industrial processes with necessary diagram. **04**
(c) Draw the block diagram of PLC system and explain the function of each block. **07**
- Q.2** (a) List the input and output ON-OFF devices for PLC. **03**
(b) Explain the PLC input module with neat sketch. **04**
(c) Explain the scanning process in PLC with neat sketch and suitable example. **07**
- OR**
- Q.3** (c) Write technical note on: PLC as Computer. **07**
(a) Explain UP-DOWN counter of PLC in brief. **03**
(b) Discuss input registers of PLC. **04**
(c) Write technical note on: PLC timer functions. **07**
- OR**
- Q.3** (a) Explain PLC table-to-register function. **03**
(b) Explain PLC master control relay function. **04**
(c) Discuss jump with return and jump with non-return functions of PLC with necessary diagram. **07**
- Q.4** (a) Discuss the step of automation in brief. **03**
(b) Explain the considerations of SCADA systems. **04**
(c) Write technical note on: SCADA Protocols. **07**
- OR**
- Q.4** (a) Explain the components of SCADA system in brief. **03**
(b) Write technical note on: Error Detection **04**
(c) Explain the master station and master terminal unit of SCADA systems. **07**
- Q.5** (a) Discuss hot standby and cold standby with reference to DCS. **03**
(b) Explain common configurations of DCS. **04**
(c) Write technical note on: System Availability. **07**
- OR**
- Q.5** (a) Explain the input/output redundancy in DCS. **03**
(b) Discuss the documentation with reference to DCS. **04**
(c) Explain the application of DCS in petroleum-refining environment. **07**
