

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162421****Date:14-07-2023****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) Explain types of industrial processes in brief. **03**
(b) List the advantages of programmable logic controller. **04**
(c) Explain the Remote Terminal Unit (RTU) of SCADA system with necessary diagrams. **07**
- Q.2** (a) Draw PLC equivalents for 4-input AND, OR and NOT logic gates. **03**
(b) Define Automation. Explain the main components of industrial automation. **04**
(c) Explain the input and output modules of PLC with its layout. **07**
- OR**
- (c) Explain the process scanning considerations of PLC with suitable example. **07**
- Q.3** (a) List input and output devices for the PLC. **03**
(b) Explain single and group input registers of PLC. **04**
(c) Explain jump with return and jump with non-return functions of PLC with suitable example. **07**
- OR**
- Q.3** (a) Discuss about the ladder diagram with reference to PLC. **03**
(b) List the timer functions of PLC. Explain any one with its timing diagram. **04**
(c) Explain arithmetic functions of PLC with necessary diagrams. **07**
- Q.4** (a) List the considerations of SCADA systems. **03**
(b) State the advantages of the SCADA system. **04**
(c) Write technical note on: PLC Move functions. **07**
- OR**
- Q.4** (a) Explain error detection in SCADA. **03**
(b) Explain PLC SKIP function and its application. **04**
(c) Write technical note on: Specialized SCADA protocols. **07**
- Q.5** (a) Explain input/output redundancy with reference to DCS. **03**
(b) Explain the application of DCS in Iron Plant. **04**
(c) Write technical note on: Availability enhancement in NCS. **07**
- OR**
- Q.5** (a) Explain hot standby and cold standby with reference to DCS. **03**
(b) Explain the application of DCS in Oil and Gas processing. **04**
(c) Write technical note on: Availability analysis in NCS. **07**
