

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3162421

Date:24-05-2024

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) Draw PLC equivalents for AND, OR and NOT gates. 03
(b) List out the advantages of PLC. 04
(c) Explain PLC Input and Output modules with necessary diagrams and layouts. 07

- Q.2 (a) List out the needs met by automation. 03
(b) Compare Localized Process & Distributed Process in tabular forms. 04
(c) Explain Process Scanning considerations in PLC with necessary diagrams. 07

OR

- (c) Explain power supplies of PLC with necessary diagram. 07
- Q.3 (a) Explain PLC off-delay timer with timing diagram. 03
(b) Draw the PLC logic ladder diagrams for standard start-stop circuit and forward reverse control. 04
(c) Explain the P.L.C. arithmetic functions & draw block format of each. 07

OR

- Q.3 (a) Explain PLC UP-DOWN combinational counter. 03
(b) Explain retentive timer of PLC with the help of timing diagram. 04
(c) Explain the P.L.C. SEQUENCER function. Write the ladder for sequencer with timer pulsing. 07
- Q.4 (a) Explain Holding registers of PLC. 03
(b) Explain CSMA/CD protocol for SCADA with its format. 04
(c) Explain the P.L.C. MOVE functions & illustrate the single register move using an addition process. 07

OR

- Q.4 (a) Compare Distributed Control System & Network Control System. 03
(b) Explain application of DCS in oil and gas processing environment. 04
(c) Explain JUMP WITH RETURN & JUMP WITH NON RETURN instructions. 07

- Q.5 (a) List advantages of SCADA. 03
(b) Explain the standby schemes with reference to DCS. 04
(c) Write technical note on: Remote Terminal Unit (RTU). 07

OR

- Q.5 (a) Explain supervisory station of DCS. 03
(b) List the key features of SCADA. 04
(c) Write technical note on: The Master Station. 07
