

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Subject Code: 182403**Date: 09/05/2013****Subject Name: Industrial Automation (Department Elective – II)****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.

- Q.1 (a)** Explain the process scanning in PLC with the help of scan cycle and appropriate example. **07**
- (b)** Define PLC. Draw the layouts of PLC input and output modules and explain each in detail. **07**
- Q.2 (a)** Draw the timing diagram of retentive timer. Draw the timing diagram and write PLC ladder logic equivalent of ON Delay and Dual OFF Delay timer. **07**
- (b)** Explain (i) Latch and Unlatch functions of PLC with standard Start-Stop seal circuit and (ii) Conventional Forward-Reverse circuit with the help of PLC ladder logic equivalent. **07**
- OR**
- (b)** Write PLC ladder logic equivalent for the followings. **07**
- (i) $[(P + Q + R) * (U + V) * W * X] + (S + T) * Y = Z$
- (ii) $\frac{(L + M + N) + (Q * R)}{1} * R = S$
- (iii) $\frac{1}{1} * (2 + 3) * (5 * 6) * (7 + 8 + 9) = P$
- Q.3 (a)** Explain the PLC arithmetic functions and draw block format of each. **07**
- (b)** Explain the PLC MOVE function and illustrate the single register move using an addition process. **07**
- OR**
- Q.3 (a)** Explain Equal to, Not equal to and Less than functions of PLC with example. **07**
- (b)** Explain jump with return and jump with non return instructions. **07**
- Q.4 (a)** Explain SHIFT RIGHT, REGISTER ROTATE and MULTIPLE SHIFT RIGHT functions of PLC. **07**
- (b)** Explain the Typical PLC SEQUENCER function. Write the Ladder for Sequencer with Timer Pulsing. **07**
- OR**
- Q.4 (a)** Explain in detail the PLC Counter functions. **07**
- (b)** Explain PLC Table and Register Moves in detail with necessary diagrams. **07**
- Q.5 (a)** Explain DCS integration with PLCs and Computers. **07**
- (b)** Explain the Network Access Protocols of DCS and list advantages and drawbacks of various types of Network Access Protocols. **07**
- OR**
- Q.5 (a)** Draw the Schematic of Basic DCS and explain different modules of DCS in brief. **07**
- (b)** List DCS Supervisory Computer tasks and explain each in brief. **07**
