

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – SUMMER • 2015

Subject Code: 170802**Date: 08/05/2015****Subject Name: Industrial Automation****Time: 02.30pm-05.00pm****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) What is a PLC? Draw block diagram of PLC. Explain each block in detail. **07**
 (b) What is an Industrial Automation? Give Automation's impact and explain their classification, also. **07**
- Q.2** (a) Define following terms, **07**
 (1) Cycling (2) Neutral Zone (3) Control Parameter Range (4) Control Lag
 (5) Error (6) Dead Time (7) Variable Range.
 (b) (1) A controlling variable is a motor speed that varies from 800-1750 rpm. If the speed is controlled by a 25 to 50v dc signal, calculate (a) the speed produced by an input of 38v and (b) the speed calculated as a percent of span. **04**
 (2) Explain basic block diagram of process control loop. **03**
- OR**
- (b) (1) A stepper motor has a step angle = 3.6° . (1) How many pulses are required for the motor to rotate through ten complete revolutions? (2) What pulse frequency is required? For the motor to rotate at a speed of 100 rev/min? **04**
 (2) Advantages and Disadvantages of Automation. **03**
- Q.3** (a) Explain PI Controller with suitable application. **07**
 (b) Explain in detail the input-output module used in PLC. **07**
- OR**
- Q.3** (a) Explain Timer and counter instructions for PLC with timing diagram. **07**
 (b) Explain following discontinuous controller modes with suitable application, **07**
 (i) Two position mode, (ii) Multi position mode.
- Q.4** (a) Give Comparison of the terms SCADA, DCS, and PLC. **07**
 (b) Develop & explain the Ladder Diagram for a temperature measurement and control jig. **07**
- OR**
- Q.4** (a) What is the importance of DCS in automation? Discuss architecture-hierarchy of DCS at function levels. **07**
 (b) Explain elements of ladder diagram and its application. **07**
- Q.5** (a) Explain importance of LAN for DCS. **07**
 (b) Explain SCADA with suitable diagram. **07**
- OR**
- Q.5** (a) Explain different types of Communication Standards used in DCS. **07**
 (b) Explain the three main components of SCADA. **07**
