Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2180807 **Date: 02/11/2017**

Subject Name: Industrial Automation

Time:02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define following terms with respect to Process control: (1) Variable Range (2) Neutral Zone (3) Control Lag	**03**
	(b)	Define following Process characteristics: (1) Process Equation (2) Process Lag	**04**
	(c)	What is an Industrial Automation? Explain generalized automation and production systems and their classification.	**07**
Q.2	**(a)**	State the Advantages, Disadvantages and Applications of Industrial Automation.	**03**
	(b)	Explain the concept of Production system with its Block diagram.	**04**
	(c)	Explain Direct Digital Control in detail with suitable diagram.	**07**
		OR	
	(c)	Explain Supervisory Control in detail with suitable diagram.	**07**
Q.3	**(a)**	Define the following: (1) Error (2) Dead Time (3) Cycling	**03**
	(b)	Explain following discontinuous controller modes (i)Two position mode (ii) Multi position mode	**04**
	(c)	Explain PI Controller with suitable application.	**07**
		OR	
Q.3	**(a)**	Define : Self Regulation.	**03**
	(b)	Explain Timer and Counter instructions for PLC.	**04**
	(c)	Explain the Proportional Integral Derivative (PID) controller mode with suitable example.	**07**
Q.4	**(a)**	Explain ladder diagram elements.	**03**
	(b)	Discuss relative merits & demerits of PLC & DCS.	**04**
	(c)	Explain various types of I/O Modules and Explain the Layout of I/O separately connected to PLC	**07**
		OR	
Q.4	**(a)**	Block diagram of PLC.	**03**
	(b)	Discuss briefly about Intelligent Controllers.	**04**
	(c)	Explain the block diagram of distributed control system (DCS).	**07**
Q.5	**(a)**	Explain Application, Advantage and Disadvantage of Hydraulic system	**03**
	(b)	Explain Pneumatic control System.	**04**
	(c)	Explain SCADA with suitable diagram.	**07**
		OR	
Q.5	**(a)**	Give the Introduction about CNC machine.	**03**
	(b)	An integral controller is used for speed control with a set point of 12 rpm within a range of 10 to 15 rpm. The controller output is 22% initially. The constant Ki = -0.15% controller output per second per percentage error. If the speed jumps to 13.5 rpm, Calculate the controller output after 2 sec for a constant ep.	**04**
	(c)	Develop ladder diagram for Traffic Control Signals.	**07**