

**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 $K_i = -0.15\%$ 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



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