Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:170802 **Date:07/05/2016**

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.**

Q.1	**(a)**	What is an Industrial Automation? Explain generalized automation, production systems and their classification.	**07**
	(b)	Define following terms with respect to Process control: (1) Process (2) Variable Range (3) Error (4) Control Lag (5) Dead Time (6) Cycling (7) Neutral Zone.	**07**
Q.2	**(a)**	Explain characteristics of two position and multi-position discontinuous controller modes.	**07**
	(b)	Discuss the characteristics and applications of PI controller.	**07**
		OR	
	(b)	What kind of automation would you recommend for manufacturing? (1) Light bulbs (2) Garments (3) Textile (4) Cement (5) Printing (6) Toys (7) Pharmaceuticals.	**07**
Q.3	**(a)**	What is ladder diagram? Explain the terminologies and its applications.	**07**
	(b)	Discuss the characteristics and applications of PD controller.	**07**
		OR	
Q.3	**(a)**	Draw a block diagram of a PLC showing the main functional items and explain each block in detail.	**07**
	(b)	Explain Timer and Counter instructions with timing diagram for PLC.	**07**
Q.4	**(a)**	Explain various types of I/O Modules and Explain the Layout of I/O separately connected to PLC.	**07**
	(b)	Explain different types of displays in DCS.	**07**
		OR	
Q.4	**(a)**	Explain the concept of networking in DCS. Also explain various network topologies.	**07**
	(b)	What is DCS? Draw a hierarchical DCS structure and explain function of each level.	**07**
Q.5	**(a)**	Develop a ladder diagram for Bottle filling and Conveyor belt jig.	**07**
	(b)	Explain the concept of SCADA neat a diagram in detail.	**07**
		OR	
Q.5	**(a)**	Explain common system components of SCADA.	**07**
	(b)	A liquid-level control system linearly converts a displacement of 2 to 3 m into a 4 to 20 mA control signal. A relay serves as the two-position controller to open and close the inlet valve. The relay closes at 12 mA and opens at 10 mA. Find (a) the relation between displacement level and current, and (b) the neutral zone or displacement gap in meters.	**07**

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