Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2180807 **Date:15/05/2019**

Subject Name:Industrial Automation

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)**	Give the Introduction about CNC machine.	**03**
	(b)	Define following terms with respect to Process control: (1) Offset (2) Variable Range (3) Neutral Zone (4) Control Lag	**04**
	(c)	Give Comparison of the terms SCADA, DCS, and PLC.	**07**
Q.2	**(a)**	Block diagram of PLC.	**03**
	(b)	What is an Industrial Automation? Explain generalized automation, production systems and their classification	**04**
	(c)	Draw a block diagram of a PLC showing the main functional items. Explaining the functions of each block, also.	**07**
		OR	
	(c)	Define following Process Characteristics: 1. Process Equation 2. Process Load 3. Process Lag 4. Self-Regulation	**07**
Q.3	**(a)**	Discuss briefly about Intelligent Controllers.	**03**
	(b)	What is ladder diagram? Explain the terminologies and its applications.	**04**
	(c)	Explain following discontinuous controller modes (i)Two position mode (ii) Multi position mode	**07**
		OR	
Q.3	**(a)**	Explain Application, Advantage and Disadvantage of Hydraulic system	**03**
	(b)	Discuss the characteristics and applications of PD controller.	**04**
	(c)	What is DCS? Draw a hierarchical DCS structure and explain function of each level.	**07**
Q.4	**(a)**	Define the following: (1) Error (2) Dead Time (3) Cycling	**03**
	(b)	Explain importance of LAN for DCS	**04**
	(c)	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**
		OR	
Q.4	**(a)**	Define : Self-Regulation.	**03**
	(b)	Discuss the characteristics and applications of Proportional control mode.	**04**
	(c)	What kind of automation would you recommend for manufacturing? (Fixed/Flexible/Programmable): (1) Light bulbs (2) Garments (3) Textile (4) Cement (5) Printing (6) Toys (7) Pharmaceuticals.	**07**

Q.5	**(a)**	Explain the concept of Production system with its Block diagram.	**03**
	(b)	Explain Various types of Automation Techniques applied in Production Systems with suitable example	**04**
	(c)	Explain common system components of SCADA.	**07**

OR

Q.5	**(a)**	Explain Pneumatic control System.	**03**
	(b)	Explain supervisory digital control with suitable diagram.	**04**
	(c)	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 (1) the speed produced by an input of 38v, (2) an input voltage require for speed 1446 rpm and (3) the speed calculated as a percent of span.	**07**

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