Seat No.: _____

Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171710   **Date: 29/11/2018**

Subject Name: Process Dynamics and Control

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.**

			MARKS
Q.1	**(a)**	Discuss shrinking and swelling effects in boiler with respect to control strategies.	**03**
	(b)	Explain mass and energy balance in distillation column.	**04**
	(c)	Discuss different design aspects for waste water treatment plant.	**07**
Q.2	**(a)**	Compare batch, continuous and packed-bed reactors.	**03**
	(b)	Explain stability of reactor and effects of lag.	**04**
	(c)	Explain end point detection for continuous and batch reactor.	**07**
		OR	
	(c)	Explain the unit operations of paper industry with suitable process flow diagram.	**07**
Q.3	**(a)**	Explain dynamic behavior of first order linear system.	**03**
	(b)	Explain countercurrent type exchangers.	**04**
	(c)	Discuss the importance of system identification for sugar and cement industry.	**07**
		OR	
Q.3	**(a)**	Explain dynamic behavior of second order linear system.	**03**
	(b)	Compare different system identification methods.	**04**
	(c)	Explain the unit operations of pharma industry with suitable process flow diagram.	**07**
Q.4	**(a)**	Explain dynamic compensation of boiler.	**03**
	(b)	Explain steam temperature and pressure control for boiler.	**04**
	(c)	Discuss the effects of lag in flow rates on dynamic behavior of distillation column.	**07**
		OR	
Q.4	**(a)**	Describe feedforward control of feed water in boiler.	**03**
	(b)	Describe overhead composition control in distillation column.	**04**
	(c)	Discuss different control schemes for heat exchanger.	**07**
Q.5	**(a)**	Explain the roll of compressor in development of waste-water treatment plant.	**03**
	(b)	Describe bottom composition control in distillation column.	**04**
	(c)	Explain development of mathematical model with suitable example for process with dead time.	**07**
		OR	
Q.5	**(a)**	Describe inverse response for boiler.	**03**
	(b)	Explain the need of three element control strategy for boiler.	**04**
	(c)	Explain the unit operations of fertilizer industry with suitable process flow diagram.	**07**

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