

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
