

Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2171710****Date:30/01/2021****Subject Name:Process Dynamics and Control****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Explain dynamic behavior of first order linear system for unit step input.	03
	(b) Compare different system identification methods.	04
	(c) Explain basic control strategies for heat exchanger.	07
Q.2	(a) Explain single and two element level control schemes for boiler.	03
	(b) Discuss the factors needs to be taken care while developing mathematical models to describe process dynamics of the system.	04
	(c) Explain response to changes in steam temperature for heat exchanger.	07
Q.3	(a) Explain burner management system for boiler.	03
	(b) Discuss factors governing the conduct of reaction for chemical reactors.	04
	(c) Explain flow and pH control for chemical reactors.	07
Q.4	(a) Explain sequential & logic control in batch process.	03
	(b) Explain countercurrent type heat exchangers.	04
	(c) Discuss the importance of overhead and bottom composition control in distillation column.	07
Q.5	(a) Explain distillate reflux flow control for distillation column.	03
	(b) Explain mass and energy balance for distillation column.	04
	(c) Describe control schemes for waste-water treatment plant.	07
Q.6	(a) Explain steam temperature control for boiler.	03
	(b) Explain basic functionality of pumps and compressors for waste-water treatment plant.	04
	(c) Discuss the effects of lag in liquid and vapor flow on frequency response of a distillation column.	07
Q.7	(a) Explain three element level control for boiler.	03
	(b) Explain dynamic behavior of second order non-linear system with suitable example.	04
	(c) Explain unit operations in paper industry with the help of suitable process flow diagram.	07

- Q.8**
- (a) Explain pressure control for boiler. **03**
 - (b) Discuss the importance of end point detection for continuous and batch reactors. **04**
 - (c) Explain unit operations in petrochemical industry with the help of suitable process flow diagram. **07**

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