

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3171710****Date:08/06/2022****Subject Name:Process Dynamics And Control****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is the mathematical model of control system? What is the condition for stability of a system?	03
	(b) Explain semi-empirical mathematical modeling with advantage.	04
	(c) Explain dynamic behavior of first order linear system for unit step input. Explain with any one suitable example.	07
Q.2	(a) Explain measurement lag in heat exchanger.	03
	(b) Write list of type of Heat exchanger. Explain any one with sketch.	04
	(c) Draw and explain cascade control scheme of heat exchanger.	07
OR		
	(c) Explain exchanger bypass control with its merits.	07
Q.3	(a) Discuss shrinking and swelling effects in boiler.	03
	(b) Explain two- element feed water control for boiler.	04
	(c) Explain air-fuel ratio control for boiler.	07
OR		
Q.3	(a) Compare batch, continuous and packed-bed reactors.	03
	(b) Discuss different factors governing the conduct of reaction in reactor.	04
	(c) Explain the method of reactor temperature control.	07
Q.4	(a) Explain the difference between continuous and batch distillation.	03
	(b) Explain mass and energy balance in distillation column.	04
	(c) Explain column pressure control in distillation column.	07
OR		
Q.4	(a) Explain the dynamic behavior of first order system with equation.	03
	(b) Explain three element control strategy and its limitations for boiler.	04
	(c) Explain the countercurrent type exchangers.	07
Q.5	(a) Explain stability of reactor and effects of lag.	03
	(b) Explain the basic interlocks for safe operation of boiler	04
	(c) Discuss control of overhead and bottom composition control for a distillation column.	07
OR		
Q.5	(a) Explain the unit operations of sugar industry with process flow diagram.	03
	(b) Explain with process flow diagram the unit operations of cement industry.	04
	(c) Explain with process flow diagram the unit operations of paper industries.	07
