

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER- 3 (NEW) • EXAMINATION – WINTER - 2023

Subject Code: 3731605**Date: 02 Dec 2023****Subject Name: Process Intensification****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) Define process intensification along with detailed classification.	07
	(b) Explain the working principle of divided wall column for separation of multi component mixtures with a neat sketch.	07
Q.2	(a) Demonstrate the construction and working of static mixers with diagram and the different types of static mixer used in industry.	07
	(b) With a neat flow sheet elaborate methyl acetate production and explain how reactive distillation replaced conventional method.	07
	OR	
	(b) Describe the different types of irradiation techniques which can be used for process intensification.	07
Q.3	(a) Elaborate the different mechanisms of process intensification and its advantages with respect to safety, environment and energy.	07
	(b) Explain the concept and working of a printed circuit heat exchanger.	07
	OR	
Q.3	(a) Describe different types of plate type heat exchangers used in process intensification.	07
	(b) Describe the principle and working of a simulated moving bed reactor (SMBR) with a neat sketch.	07
Q.4	(a) Explain the working principle of mixer heat exchanger and its application in chemical industry.	07
	(b) Describe the manufacturing process of ETBE by reactive distillation with a neat process flow sheet.	07
	OR	
Q.4	(a) Demonstrate with a neat sketch the working of a membrane reactor and its application in wastewater treatment.	07
	(b) Explain reactive extraction and different types of packed columns used.	07

- Q.5 (a)** Discuss construction, working, advantages and disadvantages of Spinning Disc reactor. **07**
- (b)** Describe Monolithic Catalysts and concept of microreactors in detail. **07**
- OR**
- Q.5 (a)** Describe the working of a sonochemical reactor. **07**
- (b)** Explain the working of a catalytic plate reactor and its applications. **07**
