

Enrolment No./Seat No \_\_\_\_\_

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160507

Date:24-05-2024

Subject Name:Advanced Separation Processes

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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Write operating parameters of Ultrafiltration and Microfiltration membranes.	03
	(b) Differentiate the Reverse osmosis and Dialysis.	04
	(c) List out different working membrane modules and describe anyone in detail.	07
Q.2	(a) Enlist different materials used for membranes synthesis.	03
	(b) List out applications of membrane gas separation.	04
	(c) Explain Hybrid distillation-pervaporation system.	07
	OR	
	(c) Explain the Concept and working of the Membrane Reactor.	07
Q.3	(a) Explain Separation factor.	03
	(b) What are the factors affecting the Electrophoresis process?	04
	(c) Discuss the Paper Electrophoresis.	07
	OR	
Q.3	(a) List out the drawbacks of the conventional separation processes, and the need for advanced separation processes.	03
	(b) List the advantages and disadvantages of chromatographic separation.	04
	(c) Explain the Thin layer and paper chromatography.	07
Q.4	(a) Discuss the properties of Supercritical fluid solvents.	03
	(b) Discuss the Advantages of Supercritical fluid over Conventional Unit Operations.	04
	(c) Explain the Decaffeination of the Coffee process in detail.	07
	OR	
Q.4	(a) Why CO <sub>2</sub> is considered the most preferred as a supercritical fluid solvent?	03
	(b) List out the application of Supercritical Extraction.	04
	(c) Discuss the Residuum Oil Supercritical Extraction (ROSE) process in detail.	07
Q.5	(a) What is molecular distillation?	03
	(b) Discuss the concept of Reactive and Catalytic distillation.	04
	(c) Discuss the working mechanism of the Short Path Distillation Unit (SPDU).	07
	OR	
Q.5	(a) List out the Advantages and Disadvantages of Reactive and catalytic distillation.	03
	(b) Discuss the BALE and KATMAX packing.	04
	(c) Describe the manufacturing of MTBE by reactive distillation process.	07

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