Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160507 Date:05-12-2024

Subject Name:Advanced Separation Processes

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Figures to the right indicate full marks.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define separation factor and its importance.	**03**
	(b)	Discuss the criteria for selecting an advance separation process over conventional process.	**04**
	(c)	Classify membrane separation processes based on driving force and also list the general characteristics.	**07**
Q.2	**(a)**	List the commonly used supercritical solvents. Why CO_2 is preferred?	**03**
	(b)	Enlist the superior properties and solubility behavior of supercritical fluids compared to conventional solvents.	**04**
	(c)	Explain decaffeination of coffee with a neat diagram.	**07**
		OR	
	(c)	Explain ROSE process with a neat flow sheet.	**07**
Q.3	**(a)**	Briefly describe gas separation using membranes.	**03**
	(b)	Write short note on dialysis and electrodialysis.	**04**
	(c)	Describe the different types of packings used in reactive distillation process.	**07**
		OR	
Q.3	**(a)**	Describe the manufacturing process of MTBE by reactive distillation with a neat process flow sheet.	**07**
	(b)	Explain the concept & working of a short path distillation unit with a neat sketch.	**07**
Q.4	**(a)**	Write a short note on membrane modules.	**03**
	(b)	Elaborate a thin film composite type membrane with a diagram.	**04**
	(c)	Describe reverse osmosis process and its application in desalination of sea water.	**07**
		OR	
Q.4	**(a)**	Depict production of absolute alcohol by pervaporation process.	**07**
	(b)	Describe membrane reactor and its application in gas separation.	**07**
Q.5	**(a)**	Explain the principle of electrophoresis separation.	**03**
	(b)	What are the different factors which affect electrophoresis separation.	**04**
	(c)	Give a detailed description of the various applications of electrophoresis separation.	**07**
		OR	
Q.5	**(a)**	Discuss principle and operation of ion exchange chromatography.	**07**
	(b)	Describe thin layer and paper chromatography with a neat sketch.	**07**

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