Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III–EXAMINATION – WINTER 2015

Subject code: 2733004 **Date: 04/12/2015**

Subject Name: Advanced Separation Processes

Time: 2:30 PM to 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw neat sketches, flow sheets wherever required.**

Q.1	**(a)**	Explain manufacturing of MTBE via Catalytic distillation and compare it with conventional process.	**07**
	(b)	With a special reference to solid-liquid equilibrium diagram, explain Freeze crystallization in detail.	**07**
Q.2	**(a)**	Differentiate between Extractive distillation and Azeotropic distillation.	**07**
	(b)	With the help of a detailed flow sheet, explain the ROSE process for deasphalting by propane using supercritical extraction.	**07**
		OR	
	(b)	Explain physical significance of separation factor and mechanism of separation in brief.	**07**
Q.3	**(a)**	Explain various modules of membrane used for membrane reactor.	**07**
	(b)	State working principle and applications of Osmotic distillation.	**07**
		OR	
Q.3	**(a)**	Explain concept and working of Pressure Swing distillation.	**07**
	(b)	Explain with neat sketch the working of batch super critical extraction unit and discuss about the effect of cosolvent or modifier on super critical extraction.	**07**
Q.4	**(a)**	Explain separation by phase addition or creation.	**07**
	(b)	Explain chromatography and sorbents required for chromatography.	**07**
		OR	
Q.4	**(a)**	Explain Slurry adsorption in batch and continuous mode.	**07**
	(b)	Explain Separation Power in brief.	**07**
Q.5	**(a)**	State advantages of Reactive distillation and Catalytic distillation. Also state industrial applications of the same.	**07**
	(b)	Explain retention theory mechanism for Slurry adsorption.	**07**
		OR	
Q.5	**(a)**	Write short note on Fractional crystallization along with example and solubility chart.	**07**
	(b)	Explain concept and working of a membrane reactor.	**07**

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