Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 170504 **Date: 28/05/2012**

Subject Name: New Separation Techniques

Time: 02:30 pm – 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.**

Q.1	**(a)**	Discuss the new separation techniques applied in chemical industry and their benefits with example.	**07**
	(b)	Explain the concept of reverse osmosis and discuss in detail various water purification and desalination process using RO technology.	**07**
Q.2	**(a)**	Explain the pressure swing adsorption system with all its stages along with commercial applications.	**07**
	(b)	Discuss the properties of supercritical fluids and the advantages and disadvantages of a supercritical fluid over conventional liquid solvent for extraction process.	**07**
		OR	
	(b)	Write the advantages and disadvantages of pressure swing distillation over azeotropic and extractive distillation.	**07**
Q.3	**(a)**	Discuss the benefits of melt crystallization over conventional crystallization from solution.	**07**
	(b)	With the help of a detailed flowsheet explain the ROSE process for deasphalting by propane using supercritical extraction. Also list the advantages.	**07**
		OR	
Q.3	**(a)**	With the help of a neat sketch explain the construction and working of a melt crystallizer.	**07**
	(b)	List the advantages and disadvantages of pressure swing adsorption over cryogenic distillation.	**07**
Q.4	**(a)**	Explain the design and working of a short path distillation unit with a sketch.	**07**
	(b)	Describe the manufacturing process of ETBE by reactive distillation process and compare with the conventional process.	**07**
		OR	
Q.4	**(a)**	List the various application of short path distillation and give a detailed description of any one application.	**07**
	(b)	Discuss the various contact devices used for catalytic distillation.	**07**
Q.5	**(a)**	Write a note on ultrafiltration process and their applications.	**07**
	(b)	Explain the working principle of perevaporation and describe one commercial application in detail.	**07**
		OR	
Q.5	**(a)**	Discuss in detail various engineering problems associated with usage of membranes.	**07**
	(b)	Discuss the concept and working of membrane reactors and their applications.	**07**

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