Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 170504 **Date: 16/12/2015**

Subject Name: New Separation Techniques

Time: 10:30am to 1:00pm **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)**	Explain the concept of Reverse Osmosis and explain in detail the various membrane materials used for RO membranes.	**07**
	(b)	Write a note on the construction and working of a short path distillation unit.	**07**
Q.2	**(a)**	Explain the concept of Reactive Catalytic Distillation and enlist its advantages and disadvantages.	**07**
	(b)	On what principle does Pressure Swing Adsorption (PSA) work? Compare PSA technique with Cryogenic Distillation.	**07**
		OR	
	(b)	Explain in detail the purification of hydrogen using six bed PSA technique.	**07**
Q.3	**(a)**	Enlist and explain the various applications of Reactive and Catalytic distillation.	**07**
	(b)	Enlist the various advantages and disadvantages of Pressure Swing Distillation (PSD) over Extractive and Azeotropic distillation.	**07**
		OR	
Q.3	**(a)**	Write a note on BALE & KATMAX packing for Reactive catalytic distillation columns.	**07**
	(b)	Explain the concept and working of Pressure Swing Distillation in detail.	**07**
Q.4	**(a)**	Enlist & explain the different types of crystallization.	**07**
	(b)	Explain in brief the working principle of Supercritical Extraction and give a detailed explanation of decaffeination of coffee using this technique.	**07**
		OR	
Q.4	**(a)**	Explain the concept of melt crystallization and explain its applications.	**07**
	(b)	Write a detailed note on the commercial applications of RO.	**07**
Q.5	**(a)**	What are the various commercial applications of Ultrafiltration.	**07**
	(b)	Explain the various advantages and disadvantages of the membrane reactor.	**07**
		OR	
Q.5	**(a)**	Explain the working principle and commercial application of pervaporation.	**07**
	(b)	Explain the working principle and applications of membrane or osmotic distillation.	**07**

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