Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2160507 **Date: 11/12/2019**

Subject Name: Advance Separation Techniques

Time: 02:30 PM TO 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)**	Explain concept of Sort Path Distillation Unit (SPDU).	**03**
	(b)	Explain working principle and various advantages of Pervaporization.	**04**
	(c)	Explain in detail with neat flow diagram: Manufacturing process of MTBE by reactive distillation	**07**
Q.2	**(a)**	Discuss various membrane materials for Reverse Osmosis (RO).	**03**
	(b)	Discuss Advantages & disadvantages of Pressure Swing Distillation (PSD) over azeotropic and extractive distillation.	**04**
	(c)	Explain in detail about various membrane modules used in membrane separation processes.	**07**
		OR	
	(c)	Explain in detail: Different techniques of Melt crystallization	**07**
Q.3	**(a)**	Discuss various applications of membrane reactor.	**03**
	(b)	Explain working principle of membrane or osmotic distillation.	**04**
	(c)	Explain working principle of super critical extraction. Discuss advantages and disadvantages of super critical extraction over liquid-liquid extraction.	**07**
		OR	
Q.3	**(a)**	State various applications of Pressure Swing Distillation (PSD).	**03**
	(b)	Differentiate: Short path distillation & molecular distillation	**04**
	(c)	Explain in detail with neat flow diagram: Decaffeination of coffee	**07**
Q.4	**(a)**	Discuss various commercial applications of pervaporization in brief.	**03**
	(b)	Explain Concept of osmosis and reverse osmosis.	**04**
	(c)	Discuss principle of Pressure Swing Adsorption (PSA) with its commercial applications in detail.	**07**
		OR	
Q.4	**(a)**	State various applications of membrane or osmotic distillation.	**03**
	(b)	Explain concept and working of membrane reactor.	**04**
	(c)	Write in detail about four step Pressure Swing Adsorption (PSA) process.	**07**
Q.5	**(a)**	Discuss various applications of Melt Crystallization in brief.	**03**
	(b)	Discuss with neat sketch: BALE and KATMAX packing for reactive and catalytic distillation	**04**
	(c)	Explain working principle of ultrafiltration and compare it with conventional filtration.	**07**
		OR	
Q.5	**(a)**	State various applications of short path distillation unit (SPDU).	**03**
	(b)	Give detail classification of membrane separation techniques.	**04**
	(c)	Discuss commercial applications of ultrafiltration and nano filtration in detail.	**07**

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