Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013

Subject code: 731601 **Date: 26-11-2013**

Subject Name: Process Intensification

Time: 10.30 am – 01.00 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 process intensification in brief. Give advantages of (PI) process intensification in terms of safety.	**07**
	(b)	Explain swirl flow devices and surface tension devices as passive enhancement techniques for heat transfer.	**07**
Q.2	**(a)**	Explain plate heat exchanger in brief.	**07**
	(b)	Explain the features of the HiGee operation.	**07**
		OR	
	(b)	Describe in detail about the energy conservation through the way of process intensification.	**07**
Q.3	**(a)**	Write brief about the reactive crystallization with its advantages and limitations.	**07**
	(b)	Explain intensified methane reforming.	**07**
		OR	
Q.3	**(a)**	Discuss Microwaves and Radio frequency fields used for intensified drying.	**07**
	(b)	Write in brief about how the process intensification is applicable in membrane technology.	**07**
Q.4	**(a)**	Describe the static mixers and Rotor stator mixers in detail.	**07**
	(b)	Write about the Uranium enrichment by centrifuge in intensified nuclear industry.	**07**
		OR	
Q.4	**(a)**	Give an overview of potential for process intensification in petro-chemical industry.	**07**
	(b)	Explain Oscillatory baffled reactor in detail.	**07**
Q.5	**(a)**	Discuss the concept and equipment used for the integration of heat transfer and reaction in process intensification.	**07**
	(b)	Discuss the application of process intensification to decrease the amount of energy and water in Laundry process.	**07**
		OR	
Q.5	**(a)**	Give brief about the Ultrasonic refining of the glass.	**07**
	(b)	Discuss about the various techniques applicable for treatment of waste water in process intensification.	**07**

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