

**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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