

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012

Subject code: 170504**Date: 27/12/2012****Subject Name: New Separation Techniques****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- | | | | |
|------|-----|--|----|
| Q.1 | (a) | Explain in detail about principles and different types of membrane separation processes with applications of each. | 07 |
| | (b) | Discuss importance of supercritical solvents and principles of supercritical extraction with industrial application. | 07 |
| Q.2 | (a) | Write in detail about Reactive & Catalytic Distillation and explain manufacturing of MTBE in detail. | 07 |
| | (b) | What is the difference between molecular distillation and short path distillation? Write five industrial application of short path distillation. | 07 |
| | | OR | |
| | (b) | What is the principle of Short path distillation and discuss working of SPDU unit. | 07 |
| Q.3 | (a) | Write in detail about 4 step Pressure Swing Adsorption process. | 07 |
| | (b) | What is the difference between Melt Crystallization and Distillation? Discuss the industrial application of Melt Crystallization. | 07 |
| | | OR | |
| Q.3 | (a) | Describe the different techniques of Melt Crystallization | 07 |
| | (b) | Discuss principle of Pressure Swing Adsorption with one industrial application in detail. | 07 |
| Q.4 | (a) | Discuss advantages and disadvantages of supercritical extraction over liquid-liquid extraction. | 07 |
| | (b) | Explain principles of Pervaporization with example of production of absolute alcohol. | 07 |
| | | OR | |
| Q. 4 | (a) | Discuss BALE and KATAMAX packing with neat figures of it. | 07 |
| | (b) | Write in detail about Osmotic distillation and its various industrial applications. | 07 |
| Q.5 | (a) | Compare Reverse Osmosis and Ultra filtration keeping operating pressure, membrane pores and types of application in mind? | 07 |
| | (b) | What is Azeotropic and Extractive Distillation? Discuss advantages and disadvantages of Pressure Swing Distillation over Azeotropic and Extractive distillation. | 07 |
| | | OR | |
| Q.5 | (a) | Explain concept of Osmosis and Reverse Osmosis. What are the different types of material used to manufacture membranes? | 07 |
| | (b) | Write and discuss about Membrane Reactors. | 07 |
