Seat No.:	Enrolment No

# GUJARAT TECHNOLOGICAL UNIVERSITY BE- VII<sup>th</sup> SEMESTER-EXAMINATION – MAY/JUNE- 2012

Subject code: 170504

BE- VIII SEMESTER-EXAMINATION - MAY/JUNE- 2012

Date: 28/05/2012

**Subject Name: New Separation Techniques** 

Time: 02:30 pm – 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) Discuss the new separation techniques applied in chemical industry and their benefits with example.
  - (b) Explain the concept of reverse osmosis and discuss in detail various water purification and desalination process using RO technology.
- Q.2 (a) Explain the pressure swing adsorption system with all its stages along with commercial applications.
  - (b) Discuss the properties of supercritical fluids and the advantages and disadvantages of a supercritical fluid over conventional liquid solvent for extraction process.

### OR

- (b) Write the advantages and disadvantages of pressure swing distillation over azeotropic and extractive distillation.
- Q.3 (a) Discuss the benefits of melt crystallization over conventional crystallization from solution.
  - (b) With the help of a detailed flowsheet explain the ROSE process for deasphalting by propane using supercritical extraction. Also list the advantages.

### OR

- Q.3 (a) With the help of a neat sketch explain the construction and working of a melt crystallizer.
  - (b) List the advantages and disadvantages of pressure swing adsorption over cryogenic distillation.
- Q.4 (a) Explain the design and working of a short path distillation unit with a sketch.
  - (b) Describe the manufacturing process of ETBE by reactive distillation process and compare with the conventional process.

#### OR

- Q.4 (a) List the various application of short path distillation and give a detailed description of any one application.
  - **(b)** Discuss the various contact devices used for catalytic distillation.
- Q.5 (a) Write a note on ultrafiltration process and their applications. 07
  - (b) Explain the working principle of perevaporation and describe one commercial application in detail.

#### ΛD

- Q.5 (a) Discuss in detail various engineering problems associated with usage of membranes.
  - (b) Discuss the concept and working of membrane reactors and their applications.

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