Seat No.: _____

Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-V EXAMINATION – WINTER 2015

Subject Code: 153502 **Subject Name: Basics of Mass Transfer** Time: 10:30am to 1:00pm

Date:17/12/2015

07

07

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) Define the following terms: vapor pressure, relative volatility, critical 07 moisture content, absolute humidity, percent humidity, dew point and partial pressure.
 - (c) Derive a relation between individual and overall mass transfer coefficients 07 according to two film theory.
- Describe the process of binary distillation with the help of a T-xy diagram. Q.2 (a) 07
 - (b) With a neat sketch of continuous fractionating distillation column explain 07 relative volatility, reflux and q-line.

OR

- (b) Describe Batch distillation with the help of a neat diagram.
- Q.3 (a) Write principle of membrane separation. Explain the types of membrane in 07 detail.
 - (b) Give importance of drying operation. Describe with diagram drying curve. 07 OR
 - (a) With neat sketch explain construction and working of vacuum crystallizer. 07
 - (b) Explain the construction and working of a tray drier with a neat diagram. 07
- (a) Draw the neat sketch of agitated vessel for gas absorption and write its **Q.4** 07 construction and functioning
 - (b) Define leaching and give at least two industrial applications of the process. 07 Describe the effect of various factors on the rate of leaching. Explain the terms overflow and underflow.

OR

(a) Explain the mechanism of crystallization process. 07 (b) What are the different types of packing material used in packed tower? 07

Differentiate between random and regular packing arrangement.

- Q.5 (a) With the help of neat diagrams describe horizontal tube and vertical tube natural 07 circulation evaporators.
 - (b) With neat sketch explain construction and working of Oslo cooling 07 crystallizer.

OR

- (a) Describe with a schematic diagram Induced draft cooling tower. 07
- (b) Derive Rayleigh equation for batch distillation.