

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – WINTER • 2014

Subject Code: 150505**Date: 08-12-2014****Subject Name: Fundamentals of Chemical Engineering Unit Operations****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) Define Unit operations and list out the types of unit operations giving brief introduction. **07**
- (b) Define fluid. Discuss about the Newtonian and Non Newtonian behavior of fluids with suitable examples. **07**
- Q.2** (a) Draw a neat and labeled sketch of different parts in shell and tube heat exchanger and explain the function of any two parts. **07**
- (b) Discuss the classification of mass transfer operation in detail. **07**
- OR**
- (b) Classify the size reduction equipments and briefly explain the construction, working principle and industrial application of any one of them. **07**
- Q.3** (a) Explain Bernoulli's equation for the flow of an incompressible fluid through a pipe. List the assumptions involved and the correction factors. **07**
- (b) List out the various types of flow meters. Explain working principle of any one of them. **07**
- OR**
- Q.3** (a) Name the various types of pumps used for the fluid transportation. Briefly explain the construction and working of any one of them. **07**
- (b) What are various modes of heat transfer? Explain them with an example. **07**
- Q.4** (a) What is evaporation? Explain the working principle and industrial application of falling film type evaporator. **07**
- (b) Explain working of cyclone separator or hydrocyclones. **07**
- OR**
- Q.4** (a) Write a note on any one type of Filter used in chemical industry in detail. **07**
- (b) Explain distillation process and relative volatility. Explain the working of a distillation column with a detailed schematic representation. **07**
- Q.5** (a) Describe liquid-liquid extraction process and criteria for selection of solvent. **07**
- (b) Explain the construction and working of any one drier with a neat diagram. **07**
- OR**
- Q.5** (a) Explain crystallization process and describe different types of crystallizers in brief. **07**
- (b) State and discuss types of water cooling tower with neat diagram. **07**
