

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER • 2014****Subject Code: 150505****Date: 24-06-2014****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) Explain the different modes of heat transfer. Also write the important laws. **07**
(b) Describe the working of jaw crusher and roller crusher. **07**

- Q.2** (a) Explain the construction and working of a packed column along with different types of packing used. **07**
(b) With the help of a neat diagram, explain the construction and working of a 1-2 shell & tube heat exchanger. **07**

OR

- (b) Explain the working principle of a venturimeter with a neat sketch. Write the major equation. **07**

- Q.3** (a) Write short note on: i) centrifugal pump and ii) NPSH **08**
(b) Briefly explain the working of a plate and frame filter press. **06**

OR

- Q.3** (a) Write short notes on: i) valves and ii) cyclone separator. **08**
(b) Explain critical speed of a ball mill. **06**

- Q.4** (a) (i) Discuss multiple effect evaporation and its importance. **08**
(ii) Differentiate between natural and forced convection.
(b) Show the difference between Newtonian and non-Newtonian fluid along with a graph. **06**

OR

- Q.4** (a) Define: i) Kirchoff's law, ii) black body, **08**
iii) thermal conductivity, iv) Bernoulli's principle.
(b) Differentiate between dropwise and filmwise condensation. **06**

- Q.5** (a) Explain the construction and working of a sieve tray tower with a diagram. **07**
(b) Describe forced draft and induced draft cooling towers. **07**

OR

- Q.5** (a) Explain liquid-liquid extraction process and criteria for selection of solvent. **08**
(b) Write in brief on: i) spray drier and ii) tray drier **06**
