

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 150505****Date: 23-01-2013****Subject Name: Fundamentals of Chemical Engineering Unit Operations****Time: 02:30 pm to 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** Explain the following. **14**  
(a) Newtonian and non-newtonian fluids  
(b) Continuity equation and modified Bernoulli's equation

**Q.2** (a) Discuss crushing laws and work index. **07**  
(b) List out the various types of flow meters. Explain working principle of any one of them. **07**

**OR**

(b) Discuss about the various types of valves and their criteria of selection. **07**

**Q.3** List out the various types of crushers and grinders. Explain working principle of any one crusher and any one grinder in detail. **14**

**OR**

**Q.3** Discuss the following. **14**  
(a) Filter media  
(b) Filter aid  
(c) Filter medium resistance  
(d) Shape factor

**Q.4** Explain about the different modes of heat transfer and their laws applied to calculate heat flux. **14**

**OR**

**Q.4** With neat sketch explain the working of multi effect evaporator and different types of feeding arrangements of the same. **14**

**Q.5** Discuss the working principle of Cooling tower, different types of cooling towers and their selection criteria. **14**

**OR**

**Q.5** Discuss the operation of multistage counter current distillation. Also discuss about the criteria of selection between packed tower and tray tower for distillation. **14**

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