II B.Tech II Semester Examinations,April/May 2012
MECHANICAL UNIT OPERATIONS
Chemical Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What are the characteristic ways in which the size reduction equipment do their work?

   (b) A crusher was used to crush a material with a feed size of -5.08+3.81 cm and the power required was 3.73 kWh/ton. The screen analysis of the product was as follows:

	Through	On	On	On	On	On	On
Size of aperture, cm	0.63	0.380	0.203	0.076	0.051	0.025	0.013
% product	Nil	26	18	23	8	17	8

   What would be the power required to crush one ton per hurof the same material from a feed -4.44 cm +3.81 cm to a product of average size 0.051 cm? Use Rittinger's law.   [4+12]

2. (a) Discuss about the construction and operation of a continuous rotary vacuum filter with a neat diagram.

   (b) What is a precoat filter? Describe its operation and use.   [10+6]

3. Discuss the method of sedimentation. Describe how, based on a single batch sedimentation test conducted in the laboratory the minimum cross-sectional area of continuous thickener can be determined. What are the factors which effect sedimentation? Explain the specific application of continuous thickener in industry.
                                                                        [16]

4. Write short notes on:

   (a) Crossflow filtration

   (b) Ultrafiltration

   (c) Microfiltration.   [16]

5. Give a detailed account of belt conveyors.   [16]

6. (a) Discuss the principles of impeller mixers.

   (b) Describe agitation and mixing of liquids.   [8+8]

7. Discuss about different mixers for free flowing solids.   [16]

8. (a) Discuss the industrial importance of crystallization.

   (b) What are invariant crystals?   [8+8]

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Set No. 4

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