Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BPHARM – SEMESTER I • EXAMINATION – WINTER • 2014

Subject code: 2210001 **Date: 26-12-2014**

Subject Name: Unit Operation - I

Time: 10:30 am - 01:30 pm **Total Marks: 80**

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define: Size reduction. Give objectives of size reduction. Explain the mechanisms of size reduction with a suitable diagram.	**06**
	(b)	Describe construction, working, advantages, limitations and uses of fluid energy mill.	**05**
	(c)	Describe ball mill with working principle.	**05**
Q.2	**(a)**	Describe standards of sieve. How powders are classified according to size as per Indian Pharmacopeias?	**06**
	(b)	Describe Principle, construction and working of cyclone separator.	**05**
	(c)	Comment: (A. Turbine mixers are suitable for emulsification. (B. The thickness of screen influences size reduction by Hammer mill.	**05**
Q.3	**(a)**	Explain the terms: Positive Mixing, Negative Mixing and Neutral Mixing in details.	**06**
	(b)	Classify liquid mixers. Describe propeller mixers.	**05**
	(c)	Define crystallization. Discuss caking in crystals and its remedy.	**05**
Q.4	**(a)**	Define : crystal. Describe the Miers' super saturation theory of crystallization. What are the limitations of the Miers' theory?	**06**
	(b)	Describe the theory of crystallization explaining each stage with a suitable diagram.	**05**
	(c)	Describe polymorphism and its significance. Explain importance of crystallization in pharmaceutical industry	**05**
Q.5	**(a)**	Enumerate types of extraction processes. Describe the Soxhlet extractor in details.	**06**
	(b)	Define: Extraction. Explain in detail the theory of extraction	**05**
	(c)	Enlist mixers for semisolids. Describe triple –roller mill	**05**
Q. 6	**(a)**	Describe automation for temperature control.	**06**
	(b)	Describe the elements for automated process control system.	**05**
	(c)	Write in brief about waste water treatment in pharmaceutical industry	**05**
Q.7	**(a)**	Write brief note on fire extinguishers.	**06**
	(b)	Explain the construction and working of vaccum crystallizer.	**05**
	(c)	(A. Differentiate between sedimentation and elutriation (B. Explain hydrates and solvates	**05**

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