Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2150502 **Date:06/05/2016**

Subject Name:Mechanical Operation

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	**(a)**	Explain differential and cumulative method of particle size analysis, Define an ideal screen and blindness in screen.	**07**
	(b)	Discuss principles of cake filtration. Differentiate between constant pressure and constant rate filtration.	**07**
Q.2	**(a)**	List out types of solid mixers and discuss Ribbon Blender in detail.	**07**
	(b)	A silty soil containing 14% moisture was mixed in a large Muller mixer with 10.0 weight percent of a tracer consisting of dextrose and picric acid. After 3 minutes of mixing, 12 random samples were taken from the mix and analyzed calorimetrically for tracer materials. The measured concentrations in the samples were, in weight percent tracer, 10.24, 9.30, 7.94,10.24, 11.08,10.03, 11.91, 9.72, 9.20, 10.76, 10.97 and 10.55. Calculate the mixing index.	**07**
		OR	
	(b)	With the help of flow diagram explain open-circuit and closed-circuit grinding operation.	**07**
Q.3	**(a)**	Explain principles of froth floatation with the detail description of a froth floatation equipment.	**07**
	(b)	With the help of a neat sketch explain the construction and working of a toothed roller crusher and write the important equations for roll crusher.	**07**
		OR	
Q.3	**(a)**	State and explain the different laws of size reduction with the importance of the work index in the size reduction.	**07**
	(b)	Classify the size reduction equipments according to their usage and give examples in each category.	**07**
Q.4	**(a)**	Explain the fluidization regimes with neat sketch and its applications in chemical industry.	**07**
	(b)	Draw neat sketch of an agitated vessel and label the important parts. What are the various methods for prevention of swirling in an agitated vessel?	**07**
		OR	
Q.4	**(a)**	What are the various equipment used for storage of solids? Discuss them with neat sketches and explain the technical problems during storage .	**07**
	(b)	Describe batch sedimentation process with a graph. Describe a continuous gravity thickener.	**07**
Q.5	**(a)**	Write a brief note on importance of Mechanical Operations in Chemical Industry.	**07**
	(b)	With the help of a neat sketch explain the construction and working of a cyclone separator.	**07**
		OR	
Q.5	**(a)**	Define agitation and mixing. Enlist different types of flow pattern induced in an Agitated vessel (liquid).	**07**
	(b)	What are the different types of conveyers? Explain in detail the belt conveyer in brief with its industrial applications.	**07**

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