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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 150502 **Date: 05/05/2017**

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)**	With neat diagram explain construction and working of plate and frame filter press also state its advantages and limitations.	**07**
	(b)	Write a short note on 'Classification of Size Reduction Equipments'.	**07**
Q.2	**(a)**	Explain fluidization and condition of fluidization with neat sketch.	**07**
	(b)	Write a short note on Jaw crusher with neat sketch.	**07**
		OR	
	(b)	A roller crusher has rolls of 200 cm in diameter and 75 cm face width. The crushing roll surfaces are 1.25 cm apart at the narrowest point. The angle of nip 30°. The roll crusher operates at a speed of 150 rpm. They are used to crush a rock of specific gravity of 2.35. Calculate the maximum permissible size of feed and the maximum actual capacity in metric tons per hour, if the actual capacity is 15% of the theoretical.	**07**
Q.3	**(a)**	Explain in detail with neat sketch: Suspended batch centrifuge	**07**
	(b)	Explain open and closed circuit operation for size reduction of solid with neat schematic diagram.	**07**
		OR	
Q.3	**(a)**	Draw a neat diagram of Cyclone Separator; explain its construction, working and applications.	**07**
	(b)	Explain in details with neat sketch: Muller mixer	**07**
Q.4	**(a)**	List different types of industrial conveyers and explain any one in detail.	**07**
	(b)	Which methods are used to prevent swirling and vortex formation in an agitated tank?	**07**
		OR	
Q.4	**(a)**	With neat diagram explain batch sedimentation test in detail.	**07**
	(b)	Write a short note on 'Pneumatic Conveyor'.	**07**
Q.5	**(a)**	Define agitation and mixing. Enlist different types of flow pattern induced in an Agitated vessel contains liquid.	**07**
	(b)	List out mixers for Non cohesive solids and discuss Ribbon mixer in detail.	**07**
		OR	
Q.5	**(a)**	With the help of neat sketch explain different types of impellers for agitation of liquids along with application.	**07**
	(b)	Calculate the power required to crush 150 tones/hr of limestone if 80 % of the feed passes through a screen 3.75 cm aperture and 80 % of the product passes through a screen with 0.03 cm aperture. The work index for lime stone is 12.75, when the capacity is expressed in tones/min, power required in HP and size of feed and product in feet.	**07**

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