Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020
Subject Code:3150502   **Date:01/02/2021**
Subject Name:Mechanical Operations
Time:10:30 AM TO 12:30 PM   **Total Marks: 56**
Instructions:
1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

			Marks
Q.1	(a)	Define (1) Mesh number (2) Angle of nip (3) Work index	03
	(b)	Write a short note on Screen analysis.	04
	(c)	Describe various laws for size reduction and write principle of comminution.	07
Q.2	(a)	What is power number and its significance?	03
	(b)	What the use is of filter aid and filter media?	04
	(c)	Give classification of various size reduction equipments.	07
Q.3	(a)	Define sphericity. Prove that sphericity of sphere is unity.	03
	(b)	What rotational speed in RPM would you recommend for a ball mill of 1200 mm in diameter charged with 75mm balls?	04
	(c)	Describe open circuit & closed circuit operation with neat sketch.	07
Q.4	(a)	Calculate the power required to crush 150 tonnes per hour of limestone if 80% of the feed passes 50mm screen and 80% of the product passes a 3.125mm screen? Work index of limestone = 12.74.	03
	(b)	Explain sink and float method.	04
	(c)	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
Q.5	(a)	What are the various equipments used for storage of solids? Discuss any one.	03
	(b)	With neat diagram explain about grizzlies.	04
	(c)	With the help of neat sketch explain different types of impellers for agitation of liquids along with application.	07
Q.6	(a)	Discuss the different criteria's for selection of conveyers.	03
	(b)	Explain: "For efficient grinding, ball mills must be operated at a speed less than the critical speed."	04
	(c)	With neat sketch, explain pneumatic conveying system with advantages and disadvantages.	07
Q.7	(a)	Explain minimum fluidization velocity.	03
	(b)	Describe batch sedimentation process with a neat sketch in details.	04
	(c)	Explain construction and working of continuous rotary vacuum filter.	07
Q.8	(a)	Discuss applications of fluidization in chemical industry.	03
	(b)	Write short note on batch centrifuge.	04

(c) With neat diagram explain construction and working of plate and frame filter press also state its advantages and limitations.   **07**