Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2143506 Date:15/05/2019

Subject Name: Unit Operations-I

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)**	Define: sphericity, terminal settling velocity and constant rate filtration.	**03**
	(b)	Write a short note on Trommel screen.	**04**
	(c)	Explain the principle, construction and working of a jaw crusher with a neat sketch.	**07**
Q.2	**(a)**	Write difference between crushers and grinders.	**03**
	(b)	Write note on attrition mill, giving outline-sketch.	**04**
	(c)	Derive the equation for critical speed of ball mill.	**07**
		OR	
	(c)	Explain the principle, construction and working of a roll crusher with a neat sketch.	**07**
Q.3	**(a)**	Define: filter media, filter aid and filtrate.	**03**
	(b)	What should be the criteria for selection of size reduction equipments?	**04**
	(c)	With the help of a neat sketch explain the construction and working of a magnetic separator with its application.	**07**
		OR	
Q.3	**(a)**	Classify different types of filtration equipments.	**03**
	(b)	Explain the need of size reduction in process industries.	**04**
	(c)	With the help of a neat sketch explain the construction and working of a cyclone separator with its application.	**07**
Q.4	**(a)**	Write applications of sedimentation.	**03**
	(b)	Discuss the process of Dorr thickener.	**04**
	(c)	Explain construction and working of plate and frame filter press with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain hindered settling and free settling.	**03**
	(b)	Describe in detail Lamella clarifier.	**04**
	(c)	What is filter medium resistance? Explain it and derive the mathematical expression for constant pressure filtration.	**07**
Q.5	**(a)**	Write difference between ideal screen and actual screen.	**03**
	(b)	Write laws of size reduction.	**04**
	(c)	Explain construction and working of bowl centrifuge.	**07**
		OR	
Q.5	**(a)**	Define: screen effectiveness and screen capacity.	**03**
	(b)	What is the difference close circuit grinding and open circuit grinding?	**04**
	(c)	Explain construction and working of bowl centrifuge.	**07**