

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV (NEW) - EXAMINATION – SUMMER 2018
Subject Code:2143506
Date:22/05/2018
Subject Name:Unit Operations-I
Time:10:30 AM to 01:00 PM
Total Marks: 70
Instructions:

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

		MARKS
Q.1*	(a) Write the basic differences between clarifier and thickener.	03
	(b) Write a short note on differential analysis.	04
	(c) With neat diagram explain construction, working and applications of cyclone separator.	07
Q.2	(a) Explain the power requirement for a crushing mill by Rittinger's power law with expression.	03
	(b) Write differences between Jaw crusher and gyratory crusher.	04
	(c) Explain the difference between open circuit and closed circuit grinding with the help of neat diagram.	07
	OR	
	(c) Derive the expression for screen effectiveness by doing material balance over a screen.	07
Q.3	(a) Classify different size reduction equipment with feed and product size.	03
	(b) What factors needs to be considered for selecting a filtering equipment.	04
	(c) Explain in detail the working and construction of a fluid energy mill with diagram.	07
	OR	
Q.3	(a) Write the formula for specific surface area, surface mean diameter and volume mean diameter for particles.	03
	(b) Discuss advantage and disadvantage of filter press.	04
	(c) Show with neat diagram the batch sedimentation of different stages and explain the differences.	07
Q.4	(a) Explain the grille filters with diagram.	03
	(b) Discuss the factors affecting screening operation.	04
	(c) Derive the expression of angle of nip for a roll mill.	07
	OR	
Q.4	(a) Describe a continuous gravity thickener.	03
	(b) Explain the working and construction of plate and frame filter press.	04
	(c) Discuss the operating cycle of a centrifugal separator with the curve of power requirement and time.	07
Q.5	(a) Write short note on magnetic separator.	03
	(b) Explain the working and construction of a rotary drum filter with diagram.	04
	(c) What is the principle of froth flotation? Explain the mechanical flotation machine with diagram.	07
	OR	
Q.5	(a) Discuss the advantage and disadvantage of bag filters.	03
	(b) Explain the working and construction of a jaw crusher with a neat sketch.	04

(c) Describe batch sedimentation process with a graph

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