

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
Diploma Engineering, Mid semester Examination

Semester: 3rd

Subject Code: 03602207

Subject Name: Mechanical Operation

Date: (20/01/2022)

Time: (1hr: 15min)

Total Marks: 40

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

Q.1	Answer any six out of Ten. (2 Marks Each)	(12)
	1. Define sedimentation	
	2. Define sphericity with its equation	
	3. Define Density and Bulk density	
	4. What is screening? And write the application of screening.	
	5. Write the definition or equation of volume surface mean diameter, mass mean diameter.	
	6. Define: Arithmetic diameter, length mean diameter.	
	7. Write the importance of screening operation.	
	8. Write the principle of flocculation.	
	9. What is unit operation? Write examples of unit operation.	
	10. Define: Terminal settling velocity, mesh number	
Q.2	A) Differentiate Unit Operation & Unit Process.	(03)
	OR	
	A) Define: Specific surface area, Volumetric diameter, surface shape factor.	(03)
	B) Differentiate ideal and actual screens.	(03)
	OR	
	B) Differentiate differential and cumulative screen analysis.	(03)
	C) Write the construction, working of vibrating screen with figure.	(04)
	OR	
	C) Write the construction, working of trommel screen with figure.	(04)
	D) A solid mixture having a certain screen analysis is screened through a standard 15 mesh screen. Calculate: (a) the mass ratio of overflow and underflow to feed and (b) the effectiveness of the screen. Due to blinding an appreciable fraction of the screen surface becomes inactive. The blinding tendency is more pronounced with fine screens than with coarse screens. Data: $D_p = D_{pc} = 2.23$ mm, $x_F = 0.37$, $x_D = 0.90$ and $x_B = 0.295$ (cumulative mass fractions).	(04)
Q.3	A) Write the construction, working of Gravity thicker with figure.	(03)
	OR	
	A) Write the construction, working of Tubular centrifuge with figure.	(03)
	B) Differentiate Grizzlies and Trommel screen analysis.	(03)
	OR	
	B) Write the Variables in Screening Operations.	(03)
	C) Explain Stoke's law and Newton's law.	(04)
	OR	
	C) Derive the formula of overall effectiveness of the screen.	(04)
	D) Write the construction, working of Cyclone Separator with figure.	(04)

