K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year: 2025-2026	Semester: III
Class: SY	Program: B.Tech
Branch Code: CHE	Pattern: 2023
Name of Course: Mechanical Operations	Course Code: 2307202
Max. Marks:60	Duration: 2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains __2___page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	What is Mesh No. ? Explain Differential and Cumulative Analysis?	(6)	1
Question No. 2			
2a)	Write a short note on cyclone separator with industrial applications.	(6)	02
Question No. 3			
3a)	What is minimum fluidization and explain with detailed diagram.	(8)	03
	OR		
3b)	Design, Construction and working mechanism of Belt conveyors.	(8)	03
3c)	Explain the Circulating Fluidization with a neat schematic diagram.	(8)	03
	OR		
3d)	Write the differences between Pneumatic and Screw conveyors.	(8)	03
Question No. 4			
4a)	Explain Ribbon Blender mixer with neat diagram. Write its applications.	(8)	04
	OR		
4b)	What is mixing and Agitation? State Purposes of Agitation operation.	(8)	04
4c)	A soil containing 14% moisture was mixed in large muller mixer with 10 weight percent of a tracer consisting of dextrose and picric acid. After 3 min. of mixing, 12 random samples were taken from the mix. and analysed for tracer material. The measured conc. in the sample were, in weight percent tracer, 10.24, 9.30, 7.94, 10.24, 11.08, 10.03, 11.91, 9.72, 9.20, 10.76, 10.97, 10.55. Calculate the mixing Index.	(8)	04
	OR		
4d)	A disk turbine with six flat blades is installed centrally in a vertical baffled tank 2m in diameter. The turbine is 0.67m in diameter and is positioned 0.67m above the bottom of the tank. The turbine blades are 134 mm wide. The tank is filled to a depth of 2m with an aqueous solution of 50% NaOH	(8)	04

at 65 degree Celsius, which has a viscosity of 12cP and density of 1,500 kg/m3. The turbine impeller truns at 90 rpm. What power will be required? Take (KT = 5.75)

Question No. 5

5a)	What is Filtration? Define filter aid, give name of filter aid and state method of using it.	(8)	05

OR

5b)	Give two examples of Filter media Enlist the characteristics of Filter media.	(8)	05
5c)	Explain Plate and Frame filter press with neat diagram.	(8)	05

OR

5d)	What is Filtration operation? Explain with diagram also explain two types of filtration.	(8)	05

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