

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3151303

Date:28-11-2024

Subject Name:Physico-chemical Treatment Technology

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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Why are screens necessary before the treatment of wastewater?	03
	(b) Explain the procedure for statistical analysis of waste water flow rate data.	04
	(c) Draw neat sketch and explain Conventional Waste-water Treatment Plant and explain The different units along with their functions.	07
Q.2	(a) Differentiate between Unit process and unit operations.	03
	(b) Enlist and explain the mechanisms of coagulation. (Along with diagram).	04
	(c) Explain jar test procedure for determining the optimum dose of chemical coagulant. What is the relation between pH, alkalinity & alum?	07
	OR	
	(c) Prepare a list of different chemical coagulants & explain the chemical reaction when alum is used as a coagulant.	07
Q.3	(a) Define 'Grit Chamber'. State its purpose.	03
	(b) Write a short note on grit removal mechanism.	04
	(c) Discuss aerated grit chamber with neat sketch. Also explain advantages and disadvantages of it.	07
	OR	
Q.3	(a) Define screen. State the purpose of screen.	03
	(b) Explain the classification of screens in detail with neat and labeled sketches.	04
	(c) Derive the Newton's law for settling velocity of a discrete particle.	07
Q.4	(a) Differentiate between flocculation and coagulation.	03
	(b) Write a short note on tube settler with neat sketch.	04
	(c) Explain the construction and working of a Slow Sand Filter along with a neat sketch.	07
	OR	
Q.4	(a) Write a note on "Operational difficulties of RSF".	03
	(b) Why sedimentation operation is important for water and wastewater treatment?	04

- (c) Explain the construction and working of a Rapid Sand Filter along with a neat sketch. **07**
- Q.5** (a) What do you mean by disinfectant? Discuss the objectives of Disinfection. **03**
- (b) Enlist and explain the factors affecting the efficiency of disinfection process. **04**
- (c) Explain Break-point chlorination and its significance to determine the chlorine demand. **07**
- OR**
- Q.5** (a) Define decanter and explain in Details. **03**
- (b) Explain sludge drying beds. Enlist and explain types of drying beds. **04**
- (c) Describe the methods normally used to process the sludge before its final disposal. **07**
