

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - VII EXAMINATION - WINTER 2025

Subject Code: 117AB01

Date: 03-12-2025

Subject Name: Design and Operation of Industrial Wastewater Treatment Process

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) Define coagulation and flocculation in wastewater treatment.	03
(b) What is a Clari-flocculator and its main function?	04
(c) Explain high-rate sedimentation techniques with sketches and design considerations.	07
Q.2 (a) Differentiate between slow and rapid sand filters.	03
(b) Write about the detention time in a grit chamber.	04
(c) State the design criteria for a grit chamber.	07
OR	
(c) Compare trickling filter and activated sludge system.	07
Q.3 (a) What is endogenous respiration in biological treatment?	03
(b) Define the term “sludge age” in activated sludge process.	04
(c) Compare aerobic and anaerobic treatment processes?	07
OR	
(a) Name the methods of sludge stabilization. Explain any one of them.	03
(b) What is F/M ratio and why is it important?	04
(c) Explain in detail the modifications of activated sludge process.	07
Q.4 (a) Define industrial wastewater. Which are the characteristics of industrial wastewater?	03
(b) Which are the environmental impacts of industrial wastewater discharge?	04
(c) Discuss the procedure for selecting a suitable treatment method for a industrial wastewater.	07
OR	
(a) Write the different chemical methods for industrial wastewater treatment and explain any one of them.	03

- (b) Which are the factors that influence the selection of a treatment method for industrial wastewater? 04
- (c) Why waste minimization and source reduction in industrial wastewater management is important? 07
- Q.5** (a) Which are the aspects of industrial wastewater treatment plant operation? 03
- (b) Define “Troubleshooting” in the context of a treatment plant. 04
- (c) Explain the concept, design considerations, and benefits of CETPs. 07
- OR**
- (a) What is meant by “Zero liquid discharge” in industries? 03
- (b) Define the concept of pollution load. 04
- (c) Describe waste reduction techniques that can be applied at the source in industries. 07
