Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160513 Date:26-05-2025

Subject Name: Waste Water Engineering

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: (1) Coagulation (2) Sludge Volume Index (3) Sedimentation	**03**
	(b)	Discuss the various source of Waste water.	**04**
	(c)	Explain ASP for waste water treatment with neat labeled flow diagram Discuss the various design parameters involved in it.	**07**
Q.2	**(a)**	List out the unit operations involved in physicochemical treatment.	**03**
	(b)	Explain the various parameters which effect the anaerobic treatment.	**04**
	(c)	Describe the waste water treatment process in Textile industry with neat flow diagram.	**07**
		OR	
	(c)	Design a process flow sheet of wastewater treatment for steel industries.	**07**
Q.3	**(a)**	Explain the importance of equalization process in a waste water treatment plant.	**03**
	(b)	Explain the role of microorganism in biological treatment processes.	**04**
	(c)	Classify different types of anaerobic reactors. Explain in detail static granular bed reactor.	**07**
		OR	
Q.3	**(a)**	List out the characteristics of wastewater.	**03**
	(b)	Differentiate between high rate trickling filters and low rate trickling filters.	**04**
	(c)	Explain a sequential batch reactor for aerobic wastewater treatment.	**07**
Q.4	**(a)**	Write the challenges faced to treat wastewater treatment.	**03**
	(b)	Explain the attached growth biological process.	**04**
	(c)	Explain the working principle of oxidation ditch with process flow diagram. List out advantages and disadvantages of oxidation ditch.	**07**
		OR	
Q.4	**(a)**	Give the design steps for trickling filters.	**03**

	(b)	Discuss Indian standards for disposal of treated wastewaters on land and in natural streams.	**04**
	(c)	Describe principle and working of Up flow Anaerobic Sludge Blanket (UASB) reactor for waste water treatment.	**07**
Q.5	**(a)**	Explain the objective of neutralization process in wastewater treatment.	**03**
	(b)	Write the various advantages and disadvantages of anaerobic processes.	**04**
	(c)	Explain in detail Duckweed pond and vermiculture technology for wastewater treatment.	**07**

OR

Q.5	**(a)**	Why reclaimed wastewater can be safe for agricultural irrigation?	**03**
	(b)	Explain the process of expanded bed reactors for anaerobic wastewater treatment.	**04**
	(c)	Explain the wastewater treatment processes in details.	**07**

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