Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) EXAMINATION – WINTER 2022

Subject Code:3160513 Date:15-12-2022

Subject Name:Waste Water Engineering

Time:02:30 PM TO 05:00 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) Sedimentation (2) Plain Sedimentation (3) Coagulation.	**03**
	(b)	Enlist various types of screens and describe coarse screens used in waste water treatment?	**04**
	(c)	Discuss in brief various types of settling processes and outline design considerations of sedimentation tanks.	**07**
Q.2	**(a)**	What is Aeration? What are the objectives of providing the aeration in water treatment?	**03**
	(b)	Differentiate between Activated sludge unit and Trickling filter.	**04**
	(c)	Explain ASP in treating waste water with neat labeled flow diagram Discuss the various design parameters involved in it.	**07**
		OR	
	(c)	Discuss about the working principle of oxidation ditch with advantages and disadvantages with a typical process flow diagram.	**07**
Q.3	**(a)**	What are the essential conditions for efficient anaerobic treatment?	**03**
	(b)	State the advantages of UASB reactor.	**04**
	(c)	Classify different types of anaerobic reactors. Explain in detail Static granular bed reactor (SGBR).	**07**
		OR	
Q.3	**(a)**	List the various advantages of anaerobic processes.	**03**
	(b)	Compare the anaerobic and aerobic processes.	**04**
	(c)	Explain in detail factors affecting anaerobic processes.	**07**
Q.4	**(a)**	Define following term for waste water treatment: i) Duckweed pond, (ii) vermiculture and (iii) root zone technology	**03**
	(b)	Enlist the various different applications of treated waste water.	**04**
	(c)	Write a note on recent advancement in wastewater treatment technologies.	**07**
		OR	
Q.4	**(a)**	Why reclaimed wastewater can be safe for agricultural irrigation?	**03**
	(b)	Describe advantages and disadvantages with respect to waste water reuse.	**04**
	(c)	Explain in detail the duckweed pond technology for wastewater treatment.	**07**
Q.5	**(a)**	Enlist various sources of industrial waste water.	**03**
	(b)	Explain the importance of equalization for industrial wastewater?	**04**
	(c)	Explain wastewater treatment scheme for sugar industries effluent?	**07**

OR

Q.5	**(a)**	Write down the name of the processes used for industrial wastewaters treatment?	**03**
	(b)	What are the various factors affecting industrial wastewater sedimentation?	**04**
	(c)	Describe waste water treatment scheme for textile industries effluent?	**07**

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