Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 3171303 Date: 26/06/2023

Subject Name: Industrial Wastewater Pollution and Control

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.**

Q.1	**(a)**	What is strength reduction? Highlight its need.	**03**
	(b)	Enlist the benefits of CETP.	**04**
	(c)	Enlist and explain the important points to the considered while selecting land as the ultimate point of effluent discharge.	**07**
Q.2	**(a)**	Explain giving example how equipment modification can lead to reduction of the strength of wastewater.	**03**
	(b)	Enlist and explain the primary and secondary benefits of industrial waste treatment.	**04**
	(c)	Explain the process of Self-purification of water body. Draw a neat sketch of DO sag curve and explain it.	**07**
		OR	
	(c)	Differentiate between stream standards and effluent standards.	**07**
Q.3	**(a)**	What is scale? Explain how it is formed.	**03**
	(b)	Explain the phenomena of Stratification and Overturn of lake	**04**
	(c)	Secondary effluent from STP is discharged into a stream. The wastewater flow is $0.12 m^3/s$ and has a BOD_5 of 20 mg/L. The temperature and DO of wastewater are 25^0C and 6.5 mg/L. The water quality of stream just upstream of discharge point is $Qr = 0.3 m^3/s$, DO = 7.9 mg/L, BOD_5 = 3 mg/L and temperature = 21^0C. kd =0.23 d^{-1} and kr = 0.45 d^{-1} at 20^0 C. The temperature coefficients for deoxygenation and reaeration are 1.12 and 1.024 respectively. Calculate critical DO. DO saturation at 22^0C = 8.74 mg/L	**07**
		OR	
Q.3	**(a)**	Explain equalization along with its purpose.	**03**
	(b)	Justify the statement "Treated municipal wastewater can be considered the source of water for industries, which is increasing in quantity and improving in quality".	**04**
	(c)	Enlist the thermal treatment methods for treatment of high strength waste water and explain any one in detail.	**07**
Q.4	**(a)**	How does segregation reduce the strength of waste water? Explain with the help of an example.	**03**
	(b)	Explain the Carbon dioxide method for treating alkaline wastes.	**04**
	(c)	Enlist and explain the techniques for Volume reduction of wastewater.	**07**
		OR	
Q.4	**(a)**	Enlist the industrial processes from which oil and grease containing wastewater is likely to originate.	**03**

	(b)	What is proportioning? What are the objectives of proportioning of industrial wastes?	**04**
	(c)	Write a note on multi effect evaporator along with a neat sketch.	**07**
Q.5	**(a)**	Explain the types of conveyance systems for transporting wastewater to CETP.	**03**
	(b)	With the help of neat sketch, explain Oil and grease trap.	**04**
	(c)	Identify the sources of wastewater for vegetable and chrome tanning. Explain the line of treatment of Vegetable tanning waste water along with diagram.	**07**

OR

Q.5	**(a)**	Prepare a list of sources of high strength wastewater along with the parameters.	**03**
	(b)	Write a note on API separator.	**04**
	(c)	What are the sources of wastewater from milk processing industry? Write down characteristics of each waste stream .Draw and explain the treatment flow diagram for dairy wastewaters	**07**

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