Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3171303 Date:30-11-2024

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 scale? Explain the causes of scale formation. **03**

(b) Explain the primary benefits of pollution control in industries. **04**

(c) What is strength reduction? Enlist & explain in brief the methods of strength reduction. **07**

Q.2 **(a)** Highlight the importance of equalization of wastewater in industries. **03**

(b) Enlist & explain the sources of oil pollution in industries. **04**

(c) Differentiate between stream standards & effluent standards. **07**

OR

(c) Enlist & explain the points to be kept in mind while selecting land as sink for disposal of wastewater. **07**

Q.3 **(a)** Enlist the objectives of CETP. **03**

(b) Explain the process of stratification & overturn of lakes. **04**

(c) A factory is discharging a wastewater to a river. Characteristics of the river water and wastewater are given in table below. **07**

	River water	**Wastewater**
Flow, m^3/s	0.56	0.17
Temperature, ^0C	15	30
Ultimate BOD, mg/L	10	60
Dissolved Oxygen, mg/L	7	2

Assume following data for river:

i. kd = 0.17/d at 20 ^{0}C with temperature correction coefficient of 1.056.
ii. kr = 0.30/d at 20 ^{0}C with temperature correction coefficient of 1.024.
iii. Average water velocity downstream of mixing point is 8 km/d.
iv. Assume saturated DO in the river as 10.1 mg/L.

Determine the DO concentration at the mixing point& critical point in the river.

OR

Q.3 **(a)** Explain the types of conveyance system for CETP. **03**

(b) Can an industry discharge its effluents into municipal sewers? What are the points to be kept in mind? **04**

(c) Write a note on self-purification of streams & explain DO sag curve. **07**

Q.4 **(a)** Write down the Streeter – Phelps equation. **03**

(b) Differentiate between free oil & emulsified oil. **04**

(c) With the help of neat sketch explain the working of oil & grease trap. Also enlist its advantages & disadvantages. **07**

OR

Q.4	**(a)**	Enlist & explain the different zones of lake based on biological activity.	**03**
	(b)	Enlist the requirements of water to be used as boiler feed water.	**04**
	(c)	Enlist the thermal treatment methods for high strength wastewater & explain any one in detail.	**07**
Q.5	**(a)**	Enlist the methods to achieve Volume reduction & explain any one in detail.	**03**
	(b)	Draw & explain the ETP scheme for diary industry.	**04**
	(c)	Draw neat figures & explain the manufacturing process, sources of wastewater & treatment plant for tannery industry.	**07**

OR

Q.5	**(a)**	Enlist the methods for Neutralization & explain any one in detail.	**03**
	(b)	Draw & explain the ETP scheme for pulp & paper industry.	**04**
	(c)	Draw neat figures & explain the manufacturing process, sources of wastewater & treatment plant for starch industry.	**07**

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