

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-IV EXAMINATION – WINTER 2025****Subject Code:3141309****Date:15-11-2025****Subject Name:Fundamentals of Wastewater Quality****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) Write a brief note on “Binary Mixture.”	03
	(b) State and explain Le Chatelier’s principle in brief.	04
	(c) Explain the principle of Solvent Extraction.	07
Q.2	(a) Define Heterocyclic compound and give 3 examples of it.	03
	(b) Define the following terms (i) Catalysis (ii) adsorption (iii) osmosis (iv) dialysis	04
	(c) Write a detail note on “Solubility product”	07
	OR	
	(c) The solubility of CaF_2 is 0.015 M at 25°C. Calculate the Solubility Product i.e. K_{sp} for CaF_2 .	07
Q.3	(a) Define the following terms (i) Enzymes (ii) Cofactors (iii) Mineralization	03
	(b) Write a short note on “Biochemistry of proteins.”	04
	(c) Calculate Theoretical COD value of (i) 3500 mg/l of glucose (ii) 3100 mg/l of acetic acid	07
	OR	
Q.3	(a) Define the following terms (i) Smoke (ii) Foams (iii) Fog	03
	(b) Define with suitable examples: Primary alcohol (ii) Secondary alcohol (iii) tertiary alcohol	04
	(c) State and explain general properties of colloids.	07
Q.4	(a) State the role of following chemical in the determination of DO. (i) NaN_3 (ii) $\text{Na}_2\text{S}_2\text{O}_3$ (iii) MnSO_4	03
	(b) State the difference between COD and BOD.	04
	(c) Explain open reflux method for measurement of COD.	07
	OR	
Q.4	(a) Enlist 4 industries that contribute oil and grease content in wastewater.	03
	(b) State the limitation of COD determination process.	04
	(c) Explain dilution method to determine BOD of wastewater.	07
Q.5	(a) Enlist the applications of volatile acid data.	03
	(b) Explain the “Smothering” action when wastewater contain high amount of grease.	04

- (c) Explain the analytical procedure used to determine oil and grease content in wastewater. **07**

OR

- Q.5** (a) Enlist the various analytical methods used to determine the sulfate concentration. **03**
- (b) State the significance of a high sulfate concentration in water supply system and in wastewater disposal. **04**
- (c) Define volatile acid. Enlist the methods used to determine volatile acids and explain any one in brief. **07**
