

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2024****Subject Code:3141309****Date:21-11-2024****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

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|------------|--|-----------|
| Q.1 | (a) What is activity and activity co-efficient? | 03 |
| | (b) Write a short note on binary mixtures and explain its classes with examples. | 04 |
| | (c) Explain standard procedure of COD determination. | 07 |
| Q.2 | (a) Define the following terms (i) Enzymes (ii) Cofactors (iii) Mineralization | 03 |
| | (b) State Hardy Schulze Law and its importance in wastewater treatment. | 04 |
| | (c) Explain the following terms in detail (i) Tyndall effect (ii) Brownian movement. | 07 |
| | OR | |
| | (c) Explain modified Winkler method for DO determination. | 07 |
| Q.3 | (a) Which factors affect the solubility of oxygen in water? | 03 |
| | (b) Enlist standard methods for the determination of sulfates in water and waste water explain any one of them in brief. | 04 |
| | (c) Classify the types of alcohols and explain each with example. | 07 |
| | OR | |
| Q.3 | (a) How are methyl orange acidity and phenolphthalein acidity related to mineral acidity and total acidity. | 03 |
| | (b) What do you understand by complex ions? Explain with example how different equilibrium constant are there for a complex ion. | 04 |
| | (c) Write a note on biodegradation of organic compounds. | 07 |
| Q.4 | (a) List five requirements of a satisfactory dilution water for BOD analysis. | 03 |
| | (b) What is the purpose of digestion of the sample in the gravimetric analysis for sulphate? | 04 |
| | (c) Explain Aliphatic and Aromatic compounds with examples. | 07 |
| | OR | |
| Q.4 | (a) Discuss the significance on volatile-acids in Environment. | 03 |
| | (b) What limit is placed on nitrogen content of drinking water and why? | 04 |
| | (c) Identify the role of carbohydrates in higher animals. Explain the mechanism by which carbohydrates are converted to simple sugar with equations. | 07 |
| Q.5 | (a) Describe the significance of particle size in Solution of solid in liquid. | 03 |
| | (b) Explain environmental significance of Solids. | 04 |
| | (c) Explain the any one standard procedure of determination of oil and grease present in wastewater. | 07 |
| | OR | |
| Q.5 | (a) Explain in brief physisorption and chemisorptions. | 03 |
| | (b) Mention the Principle of Osmosis and Reverse Osmosis. | 04 |
| | (c) Identify functional group is associated with Aldehyde, Ketone and Alcohol. Explain the nomenclature of each with example. | 07 |
