Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–I (NEW) EXAMINATION – WINTER 2023

Subject Code:3110001 Date:12-01-2024

Subject Name:Chemistry

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 polar and nonpolar covalent bonds.	**03**
	(b)	Differentiate between temporary and permanent hardness.	**04**
	(c)	Explain Lime soda process with its advantages and disadvantages.	**07**
Q.2	**(a)**	Discuss four important physical properties of metals.	**03**
	(b)	Explain the shapes of s, p, d and f orbitals.	**04**
	(c)	How will you protect metal from corrosion?? Explain wet corrosion mechanism.	**07**
		OR	
	(c)	Explain hard soft acids and bases with their properties.	**07**
Q.3	**(a)**	What is nano material? Explain the term with historical aspect.	**03**
	(b)	Write a short note on ‘top down’ and ‘bottom-up approach’ to synthesize Nanomaterials.	**04**
	(c)	Define polymerization. Give major classification of polymers with suitable examples and applications.	**07**
		OR	
Q.3	**(a)**	Define Stretching and bending vibration in IR spectroscopy.	**03**
	(b)	Define pH. Calculate pH of 0.1 N HCl.	**04**
	(c)	Explain the preparation, properties and any one specific use of the Nylon-6,6 and Buna-S rubber.	**07**
Q.4	**(a)**	State important applications of nanomaterial in catalysis.	**03**
	(b)	Discuss major disadvantages of using hard water in various industries.	**04**
	(c)	Explain the IR spectroscopy with its application.	**07**
		OR	
Q.4	**(a)**	What is a biofertilizer?	**03**
	(b)	Explain Importance of Biofuels.	**04**
	(c)	Define Fermentation. Explain manufacturing of Acetic acid by fermentation process.	**07**
Q.5	**(a)**	Define the following terms: Octane and Cetane Number	**03**
	(b)	Discuss the Selection rules for UV-Visible spectroscopy.	**04**
	(c)	What are bioreactors? Discuss the applications of biotechnology.	**07**

OR

Q.5	**(a)**	Explain Liquid Crystals.	**03**
	(b)	Write characteristics of a good fuel.	**04**
	(c)	Give classification of fuel. Discuss proximate analysis of fuel.	**07**

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