Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–I & II(NEW)EXAMINATION – SUMMER 2022

Subject Code:3110001 **Date:04-08-2022**

Subject Name:Chemistry

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.**

			Marks
Q.1	**(a)**	What is call pH? How it is significant in the chemistry of daily life?	**03**
	(b)	What is a bioreactor? Give any three important properties of enzymes.	**04**
	(c)	Define the term 'ionization energy' and explain the trends in columns and periods with examples.	**07**
Q.2	**(a)**	What is the basic principle of IR spectroscopy? Give any two applications of spectroscopic technique.	**03**
	(b)	What are electron affinity and electronegativity? Give difference between them.	**04**
	(c)	What are the two major types of coal analysis? Explain any one of them with its significance.	**07**
		OR	
	(c)	What are biodegradable polymers? Give their properties with examples. How they are important in today's scenario?	**07**
Q.3	**(a)**	Explain the term 'metallic bond' with electron sea model.	**03**
	(b)	Give the structures of natural rubber and vulcanized rubber. Enlist the advantages of vulcanized rubber.	**04**
	(c)	Give definition and purpose of alloy making. Explain about copper alloys with examples.	**07**
		OR	
Q.3	**(a)**	Explain corrosion inhibitors with examples.	**03**
	(b)	Write characteristics of good fuel.	**04**
	(c)	Explain bottom-up approaches of nanomaterial synthesis.	**07**
Q.4	**(a)**	A water sample contains 272 mg of calcium sulphate in a liter. Calculate the hardness in terms of $CaCO_3$ equivalent in ppm, mg/L, ^oCl and ^oFr.	**03**
	(b)	What is call electromagnetic spectrum? Give the names of different regions with their ranges of wavelengths in increasing order.	**04**
	(c)	Explain the role of biotechnology in the field of agriculture and medicine.	**07**
		OR	
Q.4	**(a)**	Enlist advantages and disadvantages of biofertilizers.	**03**
	(b)	Explain the terms hard soft acids and bases with examples.	**04**
	(c)	What is called boiler feed water? Explain internal treatments for softening of water.	**07**
Q.5	**(a)**	Explain the terms : Octane and Cetane numbers	**03**

	(b)	What is brackish water? How Reverse Osmosis is used for water treatment?	**04**
	(c)	Explain ionic polymerization with mechanisms with examples.	**07**
		OR	
Q.5	**(a)**	Define the terms : Liquid crystals, Glass fibers, Cathodic protection	**03**
	(b)	How protective coatings are useful against corrosion problem? Explain with examples.	**04**
	(c)	Give general applications of nano-materials and future perspectives of nano-chemistry	**07**

****