

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, °Cl and °Fr.	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**
