

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-I & II(NEW) EXAMINATION – WINTER 2022

Subject Code:3110001

Date:04-03-2023

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) Discuss the periodic trends of followings- a. Electron affinity b. Atomic size c. Electron negativity	03
	(b) Explain hard and soft acid base concept and its applications.	04
	(c) Explain the proximate analysis to estimate the percentage of moisture, volatile matter and ash content in a coal sample.	07
Q.2	(a) What do you understand by temporary and permanent hardness of water?	03
	(b) Write the chemical reaction for synthesis of polyvinyl chloride and polystyrene.	04
	(c) What is corrosion? Explain the electrochemical theory of corrosion.	07
OR		
(c)	What are alloys? Explain their applications and advantages over pure metals.	07
Q.3	(a) Explain the basic principle of Uv-vis spectroscopy?	03
	(b) Explain octane and cetane number.	04
	(c) What are the synthetic fibers? Explain synthesis, properties and application of a polyester.	07
OR		
Q.3	(a) Explain the working principle of pH meter.	03
	(b) Differentiate between sludge and scale.	04
	(c) Explain the liquid crystals, their types and applications.	07
Q.4	(a) Write any three applications of nanomaterials.	03
	(b) What are biodegradable polymers? Explain with examples.	04
	(c) Explain the importance of bio-fuel, bio-fertilizers and bio-surfactant	07
OR		
Q.4	(a) Discuss the any three applications of fullerenes.	03
	(b) Write free radical addition mechanism of polymerization.	04
	(c) Explain the role of enzymes in various industries.	07
Q.5	(a) Write the any three advantages of natural polymers.	03
	(b) Explain a method for synthesis of nano-materials.	04
	(c) Explain the basic principle of conductometric titration of acid base. Give its advantages over conventional method.	07
OR		
Q.5	(a) Write any six characteristic of good fuel.	03
	(b) Explain the specific properties of nano-materials.	04

- (c) What is infra-red (IR) spectroscopy? Explain the basic principle and applications. 07

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