

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023

Subject Code: 3162612

Date: 10-07-2023

Subject Name: Biodegradable Polymers

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 do you mean by Bioerosion of Polymers? Write the different types of it.	03
	(b) List the factors affecting biodegradation of Polymers.	04
	(c) List the natural biodegradable polymers and explain each in detail.	07
Q.2	(a) Write about Bio-Based Polymer Blends with Graphene.	03
	(b) List the advantages of biodegradable polymer blends. Write in detail about any one.	04
	(c) Describe in detail about biodegradable polymer hybrids.	07
	OR	
	(c) Describe in detail about Poly Lactic Acid (PLA) and Natural Rubber (NR) blends.	07
Q.3	(a) State the significance of Microbial Cycling of Isoprene	03
	(b) Write about the Anaerobic Biodegradation of cis-1,4-Polyisoprene.	04
	(c) Discuss in detail about the Biodegradation of trans-1,4-polyisoprene.	07
	OR	
Q.3	(a) List the applications of Poly (polyol sebacate) (PPS).	03
	(b) How the microbial degradation of synthetic polymers take place? Explain in detail.	04
	(c) Write in detail about the enzymatic degradation & enzymatic activities of PGS, PXS, and other PPS elastomers.	07
Q.4	(a) How the appropriate pH and Nutrient availability promote efficient degradation of polymers?	03
	(b) State the importance of environmental fate and ecotoxicity assessment for biodegradable polymers.	04
	(c) Discuss the different methods to assess the ecotoxicity of biodegradation intermediates.	07
	OR	
Q.4	(a) Explain the importance for assessing the bioavailability for biodegradation intermediates.	03
	(b) Which are the two pathways when biodegradable polymers come to their end life scenarios? Explain in detail.	04
	(c) Discuss in detail about specific microorganisms involved in the biodegradation process for biodegradation of polymers	07

- Q.5** **(a)** Differentiate the Biocompatible and Biopolymer with suitable example. **03**
 (b) Write the medical applications of Biodegradable biopolymers. **04**
 (c) Short not on: “Microbial Polymers”. **07**

OR

- Q.5** **(a)** What do you mean by Plant toxicity? **03**
 (b) What are the advantages and disadvantages of Chemical Vapor Deposition (CVD)? **04**
 (c) Write about Principal and applications of Plate Test for measurement of polymer Biodegradation. **07**
