

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BE03053021

Date: 17-12-2025

Subject Name: Biodegradable & Compostable 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) Define biodegradable polymer and give two example.	03
(b) Explain the chemistry and biochemistry of polymer degradation.	04
(c) Explain in detail the role of enzyme and chemical degradation in initiating biodegradation of polymers.	07
Q.2 (a) What is meant by polymer degradation ? with examples	03
(b) Discuss the mechanism of hydrolysis in synthetic biodegradation polymers.	04
(c) Discuss in detail the types and technical requirement of degradation polymers used in packing and agriculture	07
OR	
(c) Describe in detail various test method and standard used for evaluation of biodegradable plastics.	07
Q.3 (a) Explain thermoplastic starch and write their example.	03
(b) Explain the concept of photo biodegradable plastics with examples	04
(c) Explain conventional and degradable polymer recycling technologies with a suitable flow diagram.	07
OR	
(a) List any two essential technical requirements that degradable polymers for practical application.	03
(b) Discuss control of biodegradation by antioxidants.	04
(c) Elaborate on the preparation , structure, and properties of compostable polymer material.	07
Q.4 (a) Mention any two agricultural application of photo biodegradable plastics	03
(b) Describe test methods for inherent and ready biodegradability.	04
(c) Differentiate between soil biodegradation, composting , anaerobic digestion.	07

OR

- (a) What is meant by composting with their example. 03
 - (b) Explain the complications of recycling degradable plastics with examples 04
 - (c) Explain the environmental impact of compostable polymer in various ecosystems. 07
- Q.5**
- (a) Define anaerobic digestion with example. 03
 - (b) Write a note on composting methods and related legislation. 04
 - (c) Discuss compostable polymer materials in the term of application and limitation. 07

OR

- (a) Write down differences in between biodegradable and compostable polymers. 03
- (b) Discuss the thermal and thermo oxidative degradation of compostable polymers 04
- (c) Explain the types of biodegradable polymers, their degradation mechanisms, and give two industrial applications of each type. 07
