Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2013

Subject Code: 182305 **Date: 09/05/2013**

Subject Name: Biopolymers

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.**

Q.1	**(a)**	Define Bio-polymers. Depending on physical and chemical properties, classify the different types of biopolymers.	**07**
	(b)	Explain in detail about the method of production of PLA in industry. Give its chemical properties, physical properties and applications.	**07**
Q.2	**(a)**	How is biodegradable plastic made? What are the various types of compounds or materials are used to make biodegradable plastics?	**07**
	(b)	Give a comparison between the Polymer, Biopolymer, and Bioplastics?	**07**
		OR	
	(b)	Explain in details about the ñEngineering Applications of Bioplastics and Biocompositesò.	**07**
Q.3	**(a)**	Write in detail about the Cellulose Based Green Bioplastics for Biomedical Engineering.	**07**
	(b)	Write a short note on (i) Natural biodegradable polymer & (ii) Synthetic biodegradable polymer.	**07**
		OR	
Q.3	**(a)**	List out the different thermal analysis techniques used to characterize Bio-polymer. Explain in detail about any one of it.	**07**
	(b)	Write short note on (i) Scanning Electron Microscope (SEM) (ii) Transmission Electron Microscopy (TEM).	**07**
Q.4	**(a)**	Are biodegradable plastic bags a solution to the plastic carrying bag problem? Give proper scientific explanations.	**07**
	(b)	Describe the principles and applications of differential scanning calorimetry with respect to Bio-polymers.	**07**
		OR	
Q.4	**(a)**	Give the advantages and disadvantages of Synthetic Polymer and Biodegradable Polymer and their Impact on the Environment.	**07**
	(b)	Explain in details about the mixing of biomaterials with plastics. Give its equipments details and process details.	**07**
Q.5	**(a)**	Discuss the various advantages and disadvantages of biodegradable plastics?	**07**
	(b)	Write short notes on (i) Non-biological degradable polymer& (ii) Biological degradable polymer.	**07**
		OR	
Q.5	**(a)**	Explain in details Starch as a Biopolymer in Construction and Civil Engineering.	**07**
	(b)	Write short note on Cellulose Based Green Bioplastics for Biomedical Engineering.	**07**

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