Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2163902   **Date:14/05/2019**
Subject Name:Nanopolymers and Nano-composites
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.

			MARKS
Q.1	(a)	Mention Factors Affecting Tg and Tm. (at least five factors each)	03
	(b)	Explain: chain growth polymerization.	04
	(c)	Classify Polymer on the basis of microstructure.	07
Q.2	(a)	Differentiate Homopolymer and Heteropolymer.	03
	(b)	Classify Polymer on the basis of macrostructure.	04
	(c)	Explain polymer calcium carbonate. Describe its preparation and surface modification also mention and brief the techniques for fabrication.	07

OR

	(c)	Explain the Formation of ordered polymer structure at the Interfaces.	07
Q.3	(a)	Write Down full form of MMT and explain it with structure.	03
	(b)	Explain Block Copolymers for ordered polymeric Nanostructures.	04
	(c)	What is polymer? Explain its structure, molecular arrangement and characteristics.	07

OR

Q.3	(a)	Define: Copolymer and hence classify it.	03
	(b)	Describe Biodegradable Layered Polymer Nanocomposites.	04
	(c)	Describe Glass Transition Temperature and Melting Point of Polymer.	07
Q.4	(a)	Define Polymer Clay Nanocomposite (With Types).	03
	(b)	Explain Optically Anisotropic Metal–Polymer Nanocomposites	04
	(c)	An alternating copolymer is known to have number avg. molecular weight of 250000 g/mol, and a Degree of polymerization 3500. If one of the repeat units is styrene, which of ethylene, propylene, tetrafluoroethylene, and vinyl chloride is the other repeat unit? Why?	07

OR

Q.4	(a)	Explain number Avg. Molecular weight and Weight Avg. Molecular weight. Solve: Consider a polymer sample comprising of 5 moles of polymer molecules having molecular weight of 40.000 g/mol and 15 moles of polymer molecules having molecular weight of 30.000 g/mol. Calculate Mn, Mw.	03
	(b)	Explain Kinetics of Chain Growth Polymerization.	04
	(c)	Explain Cryochemical Synthesis, Structure, and physicochemical of Metal-Containing Polymer.	07

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Q.5 **(a)** Explain Metal Containing Polymers Briefly.   **03**
         (b) Write a short note on Chemistry of Polymerization.   **04**
         (c) Explain Kinetics and Reaction of Step Growth Polymerization.   **07**

OR

Q.5 **(a)** Explain: Functionally Graded Ceramics.   **03**
         (b) Define Silicon Nitride and Silicon Carbide Based Ceramics.   **04**
         (c) Write a Short Note on Nanophase ceramic composites.   **07**

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