

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018

Subject Code: 2182309/2182312

Date: 02/05/2018

Subject Name: Nano Polymer Technology (Departmental Elective - III)

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) Define Nanotechnology.	03
	(b) Why Is This Length Scale So Important?	04
	(c) Write a note on- Uniqueness of Nanostructured Materials	07
Q.2	(a) What Does Nano Really Mean?	03
	(b) List Different Types of Nanoparticles	04
	(c) Write the manufacturing process, properties and application of carbon nanofibers.	07
	OR	
	(c) Write about origin and properties of nanotitanium oxide	07
Q.3	(a) What are SWNT and MWNT?	03
	(b) Draw with proper labeling and explanation the Anatomy of a POSS molecule.	04
	(c) Write the origin, properties and application of carbon nanosilica.	07
	OR	
Q.3	(a) Write about the classification of carbon nanotubes.	03
	(b) Write a note on Small-diameter carbon nanotubes (SDNTs).	04
	(c) Explain what Nanoaluminum oxide is?	07
Q.4	(a) Explain the term "In-situ polymerization"	03
	(b) State the functions of polymer Nanostructured materials.	04
	(c) Differentiate between Thermoplastic and Thermosetting Resin Characteristics	07
	OR	
Q.4	(a) Write about the processing methods for nanoparticles and classify them.	03
	(b) List various techniques to characterize polymer Nanomaterials.	04
	(c) Explain Transmission Electron Microscopy with proper diagram.	07
Q.5	(a) State the difference between exfoliated and intercalated.	03
	(b) Write a short note on Energy-dispersive x-ray spectroscopy (EDS).	04
	(c) Write a note on Non-halogenated, flame-retardant polymers for cabling jackets.	07
	OR	
Q.5	(a) Write a note on Mass Loss Calorimetry (MLC)	03
	(b) Write a note on small angle X ray diffraction.	04
	(c) What is high shear mixing? Explain.	07