Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER • 2015

Subject code: 182303 **Date: 13/05/2015**

Subject Name: Nanotechnology and Advanced Applications of Plastics

Time:10.30AM-01.00PM **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 Nanotechnology. Explain, the form of Micro to nano-techniques	**07**
	(b)	What are building blocks of Nanotechnology? Explain it with the neat diagram.	**07**
Q.2	**(a)**	What do you understand by Nano particles, what are its benefits? Define Nano science and Nano additives.	**07**
	(b)	Explain in details the various types of bonds present in nanostructure material.	**07**
		OR	
	(b)	Write short notes on (a) Planar Technology for micro technological foundation and (b) Nanolithography (c) Vacuum UV-Lithography.	**07**
Q.3	**(a)**	What are the methods of measuring the results of fabrication of nano materials? In short, write about (a) Reduce the wavelength (b) New field Microscopy.	**07**
	(b)	Describe in details the Nucleation and Growth Approach for making Nano Particles.	**07**
		OR	
Q.3	**(a)**	What is Polymer Nanocomposites (PNC)? Explain, the types of PNC and its applications.	**07**
	(b)	List out various Nano devices and discuss in detail.	**07**
Q.4	**(a)**	Write short notes on (a) Nano-Fibers and (b) Nano Plates.	**07**
	(b)	Draw a block diagram of Different Modes of Nano manufacture. Explain the Top down method of Nanofracutre.	**07**
		OR	
Q.4	**(a)**	Write short notes on Nano materials and Nanoclay used in polymer along with examples and its applications.	**07**
	(b)	Write down the principle and working procedure of Atomic Force Microscope (AFM).	**07**
Q.5	**(a)**	Write detailed notes on characterization of nano structures by using Transmission Electron Microscope (TEM).	**07**
	(b)	Write short notes on (a) In Situ generation of ultrathin inorganic film (b) In Situ formation of inorganic nanoparticles.	**07**
		OR	
Q.5	**(a)**	Write down the principle and working procedure of Fourier Transform Infrared Spectroscopy (FT-IR).	**07**
	(b)	Write down the principle and working procedure of Scanning Electron Microscope (SEM).	**07**

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