Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2014

Subject Code: 182303 **Date: 03-06-2014**

Subject Name: Nano Technology and Advanced Applications of Plastics

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)**	What is nano-science and nanotechnology? Give its advantages, disadvantages and areas of applications.	**07**
	(b)	What are the building blocks of Nanotechnology? Explain it with the neat diagram.	**07**
Q.2	**(a)**	Write short notes on a) Bottom up method b) Lift –off method	**07**
	(b)	List the various types bonds present in nanostructure.	**07**
		OR	
	(b)	What is Electron Beam Lithography?	**07**
Q.3	**(a)**	Explain a) Carbon nanostructure b) Nano mechanical sensors	**07**
	(b)	Discuss Graphene based Materials	**07**
		OR	
Q.3	**(a)**	Explain Nano structures & Nano materials	**07**
	(b)	Discuss the role of semiconductors in the field of Nanotechnology.	**07**
Q.4	**(a)**	Write down the principle and working procedure of Transmission Electron Microscope (TEM).	**07**
	(b)	Write down the principle and working procedure of Atomic Force Microscope (AFM).	**07**
		OR	
Q.4	**(a)**	List out various Nano devices and discuss in detail.	**07**
	(b)	Write detailed notes on characterization of nano structures by using Scanning Electron Microscope (SEM).	**07**
Q.5	**(a)**	Write Down the principle and working procedure of Fourier Transform Infrared Spectroscopy (FT-IR)	**07**
	(b)	What is Polymer Nanocomposites (PNC)? Mention any types of PNC and its applications.	**07**
		OR	
Q.5	**(a)**	Write short notes on Nano materials and Nanoclay used with example and its applications.	**07**
	(b)	Explain the term planar technology. List the advantages of this technology.	**07**

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