Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 172303 **Date: 07-12-2013**

Subject Name: Medical Plastics

Time: 10:30 TO 01:00 **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)**	List the advantages of Plastics for its use as medical devices.	**07**
	(b)	Give a comparison of Plastics properties to Metals, Ceramics and Glass.	**07**
Q.2	**(a)**	Give a classification of thermoplastics used in medical applications	**07**
	(b)	Give a classification of thermoset used in medical applications	**07**
		OR	
	(b)	Give a comparison of thermoplastics and thermoset plastics , used in medical applications	**07**
Q.3	**(a)**	List the various methods of sterilization of plastics material. Discuss the Steam Sterilization method of Plastics in detail.	**07**
	(b)	What will be the effect of Electron-Beam Radiation on plastics? Discuss the Radiation stability of various plastics.	**07**
		OR	
Q.3	**(a)**	Define Leachable Plastics and Extractable Plastics. With the help of various solvents and temperature conditions explain the mechanism of Leachable and Extractable Plastics.	**07**
	(b)	Explain ISO 10993 as series of standards that detail all characterization and biocompatibility tests needed for medical plastics	**07**
Q.4	**(a)**	Write short note on (i) ISO 10993 Biocompatibility Evaluation Decision Tree. (ii) Self Life and Aging of Plastics in medical application	**07**
	(b)	List the methods used to join Plastics using heat and friction. Discuss each of them in short	**07**
		OR	
Q.4	**(a)**	Explain the various Polymer Additives used to enhance medical properties for medical device applications	**07**
Q.4	**(b)**	Discuss the various precautions to be considered when additives are to be used for medical plastics	**07**
Q.5	**(a)**	How the carbon nano tubes are are superior materials in medical plastics. Give its applications, advantages and disadvantages.	**07**
	(b)	Discuss PVC as commodity thermoplastics used in medical field. List the areas where it can be used.	**07**
		OR	
Q.5	**(a)**	Give Applications, Requirements and materials used as medical device applications for the Polyethylene group materials.	**07**
	(b)	List the special properties of Cyclo-olefin copolymers that are suitable for medical plastics.	**07**

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