

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII • EXAMINATION – WINTER • 2014

Subject Code: 172303

Date: 04-12-2014

Subject Name: Medical Plastics

Time: 10:30 am - 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) Define Medical Device and give its purpose of applications. Give its classification and types of devices. **07**

(b) Give a summary of various plastics in medical device applications **07**

Q.2 (a) In short, give the details of metals, ceramics, glass and plastics used as medical devices. List the reasons for increase in the use of plastics in medical device applications **07**

(b) List all advantages of medical devices-made from Plastics. Discuss any 4 advantages in detail. **07**

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(b) List the various types of test- requirement of Plastics used in Medical Devices. Discuss –(i) Sterilization (ii) Chemical Resistance **07**

Q.3 (a) Write short notes on- (i) Triangular diagram for classification of thermoplastics as per its performance.(ii) Property enhancement using polymer blends. **07**

(b) Write short notes on- (i) Gamma Radiation. (ii) Self Life and Aging. **07**

OR

Q.3 (a) Write short notes on- (i) Additives and their effect on Plastics (ii) Families of Plasticizers and its utility. **07**

(b) Write short notes on- (i) Pigments as Additives (ii) Conductive Fillers **07**

Q.4 (a) Write a short note on (i) Nano Additives and (ii) Carbon Nano Tubes. **07**

(b) Give the major factors for the use and popularity of PVC in medical device applications. Discuss (i) Heat Stabilizers and (ii) Plasticizers used as PVC additives. Give a list of at least 15 items of medical devices made from PVC. **07**

OR

Q.4 (a) Give a comparison of advantages and disadvantages of various types of PVC resins **07**

(b) Give a comparison of properties of various types of PVC –Un-plasticized(PVC-U) and PVC-plasticized(PVC-P) **07**

Q.5 (a) In a tabular form, give advantages and disadvantages of various Polyethylenes. **07**

(b) Give complete details of Polyethylene sterilization. Give the graphs of (i) effect of Ethylene oxide sterilization on the properties of Polyethylene and (ii) surface oxidation of Polyethylene during Gamma Radiation. **07**

OR

Q.5 (a) Give a comparison of (i) Amorphous and Crystalline co-polymers and (ii) Thermoplastics and Thermoset as medical plastics **07**

(b) Write short notes on (i) Test method for Three point bend (Stress) test for chemical resistance. (ii) Mechanical Techniques for Joining and Welding of medical plastics. **07**
