Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION - SUMMER 2016

Subject Code:172303

Subject Name: Medical Plastics

Total Marks: 70

Time: 02:30 PM to 05:00 PM

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) With the help of diagram, give a list of various hard and soft tissues of human body that can 07 be replaced/ treated by various polymers. 07
 - (b) List typical metallic and ceramic biomaterials used in human body.
- **Q.2** (a) List various additives used in the modification and tailoring of plastics performance and 07 processing.
 - (b) Write a short note on Radiopaque additives.

OR

- (b) List the methods used to join Plastics using heat and friction. Discuss each of them in short 07
- Q.3 (a) List the various methods of sterilization of plastics material. Discuss the Steam Sterilization 07 method of Plastics in detail.
 - (b) What will be the effect of Electron-Beam Radiation on plastics? Discuss the Radiation 07 stability of various plastics.

OR

- Q.3 (a) Write the advantages of Antimicrobial additives used as medical plastics. With the help of 07 graph, discuss the effect of antimicrobial levels on inhibition and destruction of microorganisms.
 - (b) Give at least 10 reasons for the increase in the use of plastics in medical device applications. 07
- Q.4 (a) Define Leachable Plastics and Extractable Plastics. With the help of various solvents and 07 temperature, conditions explain the mechanism of Leachable and Extractable Plastics.
 - (b) Explain ISO 10993 as series of standards that detail all characterization and 07 biocompatibility tests needed for medical plastics

OR

- **Q.4** (a) Give a comparison of commodity and engineering thermoplastics used in medical devise 07 applications.
- **Q.4** (b) Give a comparison of amorphous and crystalline polymers used in medical devise 07 applications.
- Q.5 (a) Give Applications, Requirements and materials used as medical device applications for the 07 Polyethylene group materials.
 - (b) List the special properties of Cyclo-olefin copolymers that are suitable for medical plastics. 07

OR

- Q.5 (a) Discuss the major factors for the use and popularity of PVC in medical device applications. 07
 - (b) Give the advantages and disadvantages of various Polyethylenes used as medical plastics. 07 (Only for LDPE, HDPE, UHMWPE and Ethylene copolymers.)

Date:10/05/2016

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