

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2014****Subject code: 731603****Date: 27-11-2014****Subject Name: Polymer Structure and Property Prediction****Time: 02:30 pm - 05:00 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) Explain the Molecular Stiffness Vs. Increasing Regularity of Molecular Structure of Polymers . (07)

(b) Chemical Structural Features are most important to each major class of Polymer Properties. Justify the statement. (07)

Q.2 (a) Oxygen is the common element in Organic Chemistry and in Polymer Structure. Justify & Explain the statement in detail. (07)

(b) List the different Chemical Properties are affected by the molecular weight of Polymer Molecule. Discuss any one in detail. (07)

OR

(b) Discuss the effects of molecular weight on Thermodynamic Properties. (07)

Q.3 (a) Explain the effects upon the Size and Shape of the Side Chain and Polarity upon the Flexibility of Polymer Molecule. (07)

(b) Write in detail about effect of Polymer molecular flexibility on Reversible Mechanical Properties and Mechanical Failure. (07)

OR

Q.3 (a) Explain in detail about the Motion of a segment in a Polymer Chain. (07)

(b) Discuss the effect of Copolymerization and Plasticiser Structure on Molecular Flexibility. (07)

Q.4 (a) Regularity of Molecular Structure makes it possible for the molecule to fit into a regular Crystalline Lattice. Explain the statement in detail. (07)

(b) Describe in detail about Cold Stretching, Warm Stretching & Wet Stretching process for Orientation of Polymer Molecule. (07)

OR

Q.4 (a) Write about Mono & Biaxial Orientation. (07)

(b) Discuss the Effects of Crystallinity on melting behaviour of Polymer Molecule. (07)

Q.5 (a) Which forces are responsible for intermolecular attraction in Hydrocarbon Polymers? Explain in detail. (07)

(b) Hydrogen Bonding and Similar Polarity are important in Compatibility between Polymers and Plasticisers. Justify the Statement. (07)

OR

Q.5 Discuss in brief about the effects of each type of Intermolecular Bond upon Polymer Properties. (14)
