

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013****Subject code: 731603****Date: 28-11-2013****Subject Name: Polymer Structure & Property Prediction****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) Explain the correlation between the structure & properties of polymer. **(07)**

(b) Establish the General Relationships between Chemical Composition and Polymer Properties. **(07)**

Q.2 (a) “Nitrogen is an important element in organic chemistry.” Justify the statement. **(07)**

(b) Short note on Mechanical Failure of Polymeric materials according to molecular size & shape. **(07)**

OR

(b) “The molecular weight of the polymer molecule has a number of significant effects upon its chemical properties.” Explain the statement in detail. **(07)**

Q.3 (a) Discuss the importance of copolymerization & plasticizer structure on molecular flexibility. **(07)**

(b) Write in detail about effect of Polymer molecular flexibility on Electrical Properties. **(07)**

OR

Q.3 (a) Establish the relationship between Thermal Motion, Free Volume & Segment Mobility of Polymer molecule. **(07)**

(b) Discuss the effect of Molecular flexibility on ultimate mechanical properties and failure of Polymeric materials. **(07)**

Q.4 (a) Discuss the three different methods for orientation of polymer molecule. **(07)**

(b) Short note on “Axes of Orientation”. **(07)**

OR

Q.4 How the Kinetic factors affecting rate and extent of crystallization? Explain in detail. **(14)**

Q.5 Discuss the effects of each type of intermolecular bond upon polymer properties. **(14)**

OR

Q.5 (a) Discuss the effect of Hydrogen Bonding upon melting and solubility behavior during processing and upon mechanical strength & adhesion. **(07)**

(b) Discuss about Ionic Bonding & Cross-Linking. **(07)**
