

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V • EXAMINATION – WINTER • 2014

Subject Code: 152302

Date: 28-11-2014

Subject Name: Physics of Plastics

Time: 10.30 am - 01.00 pm

Total Marks: 0

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Difference between dissolution of low molecular weight compounds and polymers in a solvent. Discuss in detail **07**
(b) What is intrinsic viscosity ? Discuss Mark Houwink equation and its significance **07**
- Q.2** (a) Discuss Boltzmann's Superposition Principle. **07**
(b) What are the factors affecting Tg? Discuss **07**
- OR**
- (b) List various mechanical models of visco-elastic fluids. And explain Hooke's Model in detail. **07**
- Q.3** (a) Discuss structural and stereo isomerism? Explain with examples **07**
(b) What is Avogadro's number? If a PE molecule has 3000 nos. of monomers, each with a molar mass of 28 g/mol, calculate the weight of each molecule? **07**
- OR**
- Q.3** (a) Give classification of non-Newtonian fluids and explain in detail with example **07**
(b) Define :[any seven] **07**
Crystallites ; Spherulites ; Rayleigh ratio ; Mesogens? ; Polymer fractionation ; Viscoelasticity; Entropy; polymer Melts; Polymer solutions; Nematic phase;
- Q.4** (a) Differentiate between Amorphous v/s. Crystalline polymers. **07**
(b) What is rotational viscometer? Explain Brookfield viscometer **07**
- OR**
- Q.4** (a) Discuss Flory Huggins Lattice Theory **07**
(b) Draw molecular architectures for linear, branched, crosslinked and dendritic conformations. **07**
- Q.5** (a) Discuss the Process of Polymer Crystallization **07**
(b) Discuss measurement of Mn by osmotic pressure **07**
- OR**
- Q.5** (a) Short Note on Theta Temperature and Radius of Gyration **07**
(b) Discuss Voigt Model. **07**
