

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2017****Subject Code:132301****Date:17/11/2017****Subject Name: Introduction to Plastic Material Science****Time: 10:30 AM to 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) Discuss How polymers and low molecular weight compounds are differing from each other? **07**
(b) List various steps of free radical polymerisation and explain each with suitable example. **07**
- Q.2** (a) Define polymers. Give detail classification of polymers with suitable examples. **07**
(b) What are chain and step polymerization? Give difference between them. **07**
- OR**
- (b) Give difference between thermoplastic and thermosetting plastics. **07**
- Q.3** (a) Explain Polydispersity & Molecular weight distribution in polymers. **07**
(b) What is Glass transition temperature? Discuss various factors affecting Tg. **07**
- OR**
- Q.3** (a) Explain number average and weight average molecular weight in polymers. **07**
(b) Explain bulk polymerization technique along with advantages, disadvantages and applications. **07**
- Q.4** (a) Explain optical isomerism by suitable examples. **07**
(b) Discuss various factors affecting crystallisability. **07**
- OR**
- Q.4** (a) What do you mean by Polydispersity? Explain Polydispersity & Molecular weight distribution in polymers. **07**
(b) Answer the following: **07**
i) Write a note on : Tacticity
ii) Calculate the contour length and the extended chain length of PE
Mol. Given: - $n = 6000$, Bond angle- $109^{\circ}28'$, Segment length - 1.54 \AA .
- Q.5** (a) Explain Emulsion polymerization in detail. **07**
(b) Define: Co-polymer, Initiator, Cross-linked polymer, Graft copolymer, Degree of polymerisation, Inhibitor, Block copolymer **07**
- OR**
- Q.5** (a) Explain solution polymerization technique. **07**
(b) Give difference between suspension and emulsion polymerization. **07**
