Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–V • EXAMINATION – WINTER 2013**

**Subject Code: 152302 Date: 29-11-2013**

**Subject Name: Physics of Plastics**

**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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Discuss Theta temperature. What is its significance? | **07** |
| | **(b)** | Discuss factors Affecting Crystallinity | **07** |
| **Q.2** | **(a)** | Discuss Maxwell's model | **07** |
| | **(b)** | Discuss Gel Elution technique | **07** |
| | | **OR** | |
| | **(b)** | Discuss Boltzmann's superposition Principle | **07** |
| **Q.3** | **(a)** | Draw Molecular Architectures For Linear, Branched, Crosslinked And Dendritic Conformations | **07** |
| | **(b)** | Difference between polymers and low molecular weight compounds | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss Mark Houwink equation and its significance | **07** |
| | **(b)** | What is intrinsic viscosity? | **07** |
| **Q.4** | **(a)** | Explain the Flory Huggins Lattice theory | **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.4** | **(a)** | Discuss Fox- flory equation and its significance | **07** |
| **Q.4** | **(b)** | Discuss Gaussian Distribution | **07** |
| **Q.5** | **(a)** | 1. polymer configuration v/s. polymer conformation.<br>2. Amorphous v/s. Crystalline polymers | **07** |
| | **(b)** | What is structural and stereo isomerism? Explain with examples | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Discuss RANDOM WALK Probability | **07** |
| | **(b)** | Define: Mesogens; Rayleigh ratio; Intrinsic viscosity; entropy ; nematic phase; radius of gyration ; polymer fractionation | **07** |

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