

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-III Examination-Dec.-2011

Subject code: 132301**Date: 24/12/2011****Subject Name: Introduction to Plastic Material Science****Time: 2.30 pm -5.00 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 about functionality of Monomer and its effect on Polymer structure. **07**
- (b) Explain in brief: Classification of Polymer based on Structure and Repeating Unit. **07**
- Q.2** (a) (1)Initiators are thermally stable compounds and do not decompose into products called Free radicals (True/ False) **07**
(2) _____ of the following classes belongs to polymer.(a)Phosphates(b)Steroids (c)Enzymes (d) Vitamins
(3) Hardening of Plastics often involves cross-linking. This process is called _____.
(4) _____ is not an initiator for Free radical addition polymerization
(a)Benzoyl peroxide(b)AIBN(c)Lewis acids(d) Persulphate
(5) _____ Plastics is made by Condensation Polymerization.
(a) PE (b) ABS (c) PVC (d) Nylon
(6)Which of the following is a polar polymer?
(a) Polyvinyl alcohol (b) PS (c) PE (d) All of above
(7)Inhibitors are_____
(a)Chemical substance capable of killing the chain growth(b) Produced by product(c) Activate free radicals
(d) All of above
- (b) Which are the types of Addition Polymerization? **07**
Explain Free radical Polymerization in detail.
- OR**
- (b) Explain Ziegler- Natta Polymerization in detail. **07**
- Q.3** (a) Explain Polycondensation Polymerization. **07**
- (b) Explain about Gas – Phase polymerization. **07**
- OR**
- Q.3** (a) Explain about effect of Molecular Weight on solubility of Polymer. **07**
- (b) Explain: Nature of Polymer Molecules in Solution. **07**
- Q.4** (a) Define Molecular Weight of Polymer. Explain Number Average Molecular Weight Concept. **07**

- (b) Calculate M_n & M_w for a polymer consisting of three fractions with molecular weights, 100000, 200000 and 300000. The mole fractions of each of these fractions are found to be 0.1, 0.5 and 0.4 respectively. **07**

OR

- Q.4 (a)** Explain: Polydispersity and Molecular Weight Distribution in Polymers. **07**

- (b) Explain (1) Tg & Molecular weight (2) Tg & Plasticizers **07**

- Q.5 (a)** Define Glass Transition Temperature. Explain about Viscous Flow and Visco elasticity. **07**

- (b) Explain about states of Aggregation for Low molecular weight substance and for polymer in brief. **07**

OR

- Q.5 (a)** Explain (1) Hydrolysis (2) Acidolysis **07**

- (b) Explain about effect of crystallinity on the properties of Polymer. **07**
