

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination May 2011

Subject code: 132301

Subject Name: Introduction to Plastic Material Science

Date: 25-05-2011

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) Give the classification of polymers based on their chemical structure with examples. **07**
(b) Discuss the relationship between polydispersity and molecular weight distribution in polymers. **07**

- Q.2** (a) Define and explain the term glass transition temperature. Write down the importance of glass transition temperature? Explain the relationship between glass transition temperature and melting point? **07**
(b) What are the basic steps in free radical polymerization .Explain them in brief. **07**

OR

- (b) Define inhibitors. Give their examples and also explain the commercial use of inhibitors. **07**

- Q.3** (a) Discuss stereo-regular polymers with examples. **07**
(b) Discuss ring opening polymerization. **07**

OR

- Q.3** (a) Explain polycondensation polymerization given any one example. **07**
(b) Differentiate between cationic and anionic polymerization. **07**

- Q.4** (a) Explain hydrolysis reaction and hydrogenation reactions in details. **07**
(b) Differentiate between solution polymerization and suspension polymerization. **07**

OR

- Q.4** (a) Explain the gas phase polymerization. **07**
(b) Write down the solubility behavior of amorphous and crystalline polymers? **07**

- Q.5** (a) Fill in the blanks **07**
1. Crystallisability is defined as _____
2. Thermoset materials are undergoes _____ reaction.
3. Give an example of terpolymer.
4. Give an example of synthetic polymers which is used for fiber applications.
5. Nylon-6 is formed by _____ polymerization.
6. Isotactic polypropylene is more crystalline as compared to atactic polypropylene. Say True/False
7. Suspension polymerization is also called _____

- (b)** Give reasons of following. **07**
1. Why nylon is highly crystalline as compared to Polypropylene?
 2. Why atactic polypropylene is amorphous in nature?
 3. Why thermoset materials are non-recyclable?
 4. Why polyvinyl carbazole is difficult to crystallize as compared to polyvinyl alcohol?
 5. Although Polypropylene is crystalline in nature but film made of PP is transparent .Explain.
 6. Why polystyrene is lower T_g as compared to Polymethylmethacrylate?
 7. Why polycarbonate is less resistance to chemicals as compared to nylons.

OR

- Q.5** **(a)** Differentiate between thermoplastic and thermoset polymer. **07**
- (b)** Define: Spherulites, Random copolymer, living polymerization, Initiators, Elastomer, and Degree of polymerization. Insertion polymerization. **07**
