

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

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

**Subject code: 132602**

**Date: 24/12/2011**

**Subject Name: Rubber Technology**

**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** Answer the following. **14**
- (i). Write the chemical reaction for manufacturing of Styrene monomer from Benzene.
  - (ii). Write the importance of following additives in compounding of polymer.  
i) plasticizer                      ii) stabilizer
  - (iii). Define the term: polymer degradation. List the two basic mechanism of polymer degradation.
  - (iv). Explain the terms: i) adsorption    ii) adsorbent    iii) adsorptive
  - (v). Write the advantages of amino resins over phenolic resins.
  - (vi). Explain the importance of protein as a natural polymer. . Write the name of monomeric unit present in protein.
  - (vii). Explain the effects of polar group in polymer chain to polymer crystallinity. Give one example.
- Q. 2** (a) Give the schematic diagram of hevea brasiliensis seed and its mode of germination and explain it in detail. **07**
- (b) "Nitrogen is important element in polymer chemistry." Justify the statement. **07**
- OR**
- (b) Explain the importance of chlorine element in polymer chemistry. **07**
- Q. 3** (a) Explain in detail about cellulose as a natural polymer. **07**
- (b) i) Describe the term: thermal degradation. **07**  
ii) Write the structural requirements for thermal stability of polymer.
- OR**
- Q. 3** (a) Explain the structure and importance of following natural polymer. **07**  
i)lignin    ii)natural rubber
- (b) Short note on oxidative degradation of polymers. **07**
- Q. 4** (a) List the name of manufacturing process for Acrylonitrile monomer & Explain any one in detail. **07**
- (b) Short note on glass transition temperature (Tg). **07**
- OR**
- Q. 4** (a) List the name of reagents used for manufacturing of Butadiene monomer & Explain any one process in detail. **07**
- (b) Explain about polymer crystallinity in short. Explain the influence of following factors on polymer crystallinity. **07**

- i) Degree of polymerization (DP)
- ii) Cooling rate
- iii) Chain geometry

- Q. 5** (a) Explain the production of phenolic resins. **04**
- (b) Define the term: porosity. How porosity can be obtained in polymer structure by using porophores? **03**
- (c) List the principal methods for polymer orientation. Explain any two in detail. **07**

**OR**

- Q. 5** (a) Write about the properties and applications of phenolic resins. **04**
- (b) How porosity can be obtained by using solvent in polymer structure. **03**
- (c) How porosity can be obtained by using solvent in polymer structure. **07**

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