

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

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

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

**Subject code: 132601**

**Date: 20/12/2011**

**Subject Name: Basic Rubber 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)** Discuss in detail about the applications of colloids. **07**
- (b)** Answer the following
- i** Define the following terms: 1. Creep 2. Stress Relaxation **03**  
3. Permanent Set
- ii** Why Nitrile Rubber shows superior oil resistance among all dienes? **04**
- Q.2 (a)** Discuss the conditions for rubber like elasticity in the polymers. **07**
- (b)** Answer the following
- i** What do you mean by coefficient of friction? List the factors affecting coefficient of friction with respect to rubber? **03**
- ii** Write about the sliding friction of rubber. **04**
- OR**
- (b)** Answer the following
- i** State the principle laws of floatation. **03**
- ii** Give the name of the apparatus used to measure the surface tension. Also draw its labeled diagram. **04**
- Q.3 (a)** Answer the following
- i** Write down the applications of rubber in vibration isolation found in transportation. **03**
- ii** Define the following terms: 1. Thermal Conductivity 2. Thermal Diffusivity 3. Diffusion Coefficient 4. Angle of Incidence 5. Angle of Refraction. **05**
- (b)** Write about the refractive index of polymers. **06**
- OR**
- Q.3 (a)** Answer the following
- i** Explain the term shape factor and write down its importance for rubber product. **03**
- ii** Show the different parts of electromagnetic spectrum. **05**
- (b)** Write a short note on electrical properties of rubber. **06**

- Q. 4 (a)** Answer the following
- i** Explain the classification of polymers on the basis of their chain backbone. **04**
  - ii** What do you mean by chain polymerization? List the monomers capable of undergoing the chain polymerization with their structures. **04**
- (b)** Discuss the salient features of solution polymerization technique. **06**
- Q. 4 (a)** Answer the following
- i** Explain the classification of polymers on the basis of their thermal behavior. **04**
  - ii** Which conclusions can be drawn regarding polycondensation? **04**
- (b)** Discuss the salient features of bulk polymerization technique. **06**
- Q. 5 (a)** Explain the types of colloidal systems. **07**
- (b)** Give the difference between lyophilic sols and lyophobic sols. **07**
- OR**
- Q. 5 (a)** Give the comparison of three types of colloids. **07**
- (b)** Write in detail about the micelles and also give the comparison between micelles and colloidal solution. **07**

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