

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (New) EXAMINATION – WINTER 2015

Subject Code:2132601**Date:18/12/2015****Subject Name: Basic Rubber Science****Time: 02:30pm to 05:00pm****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**
- 1 Define the term: 'functionality'
 - 2 Give the examples of R class rubbers.
 - 3 State the Hooke's law.
 - 4 What do you mean by Critical angle?
 - 5 Write the classification of friction.
 - 6 Give the formula of relative density.
 - 7 Draw the chemical structure of Natural Rubber.
 - 8 What do you mean by 'micelles'?
 - 9 How the Colloids are differing from Crystalloids?
 - 10 Give the particle size range of Colloidal solutions.
 - 11 Define the term: 'Black body'
 - 12 List the three basic modes of heat transfer.
 - 13 Write any one example which involves mass transfer phenomena.
 - 14 State the Fick's Law of mass transfer.
- Q.2** (a) Give comparison between Organic polymer and Inorganic polymer. **03**
 (b) Write down the general rules for polymer solubility. **04**
 (c) Discuss in detail about the suspension polymerization with its merits and demerits. **07**
- OR**
- (c) Explain about the conditions for Rubber-like elasticity in polymer. **07**
- Q.3** (a) Write down the main sources of error in determination of relative density of powdered solid and liquid. **03**
 (b) List the characteristics of Pigments for use in rubber compounding. **04**
 (c) Discuss about differences between Rubbery and Elastic Deformations. **07**
- OR**
- Q.3** (a) Give the laws of floatation and explain it in brief. **03**
 (b) Define the term friction. Write its examples and effects associated with friction. **04**
 (c) Write a short note on Shear Modulus. **07**
- Q.4** (a) Explain the terms: 'Vibrations and Waves' **03**
 (b) Write in brief about the Zeroth law of thermodynamics. **04**
 (c) Give the schematic representation for Maxwell Model of Viscoelasticity and describe it in detail. **07**
- OR**
- Q.4** (a) Write down the effect of processing oils on transmissibility. **03**
 (b) Explain about mass and molar concentrations by giving equations. **04**
 (c) Draw the schematic diagram of Ostwald viscometer and explain it in detail. **07**

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- Q.5 (a) Give the importance of Gel in colloidal science. 03**
(b) What do you mean by Tyndall Effect? Explain it with the help of schematic diagram. 04
(c) Discuss about Dialysis method for purification of colloids. 07

OR

- Q.5 (a) List the three possible Colloidal systems for the liquid as a dispersed phase and give the examples of each. 03**
(b) Describe the Mechanical dispersion method for preparation of colloidal solution. 04
(c) Give a detailed comparison between the True Solutions and Colloidal Solutions. 07
