

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012****Subject code: 714002N****Date: 09/01/2013****Subject Name: Mixing of Rubbers****Time: 02.30 pm – 05.00 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) Describe Scientific explanation for the four regions of processibility behavior of rubber in mill. (07)

(b) Discuss about Degree of Penetration & Degree of Packing in Carbon Black. (07)

Q.2 (a) Write in detail about two different form of Styrene Butadiene Rubber (SBR). (07)

(b) Discuss the statistical theory of nonlinear elasticity. (07)

OR

(b) Explain the viscoelastic behavior of rubber during mixing in mixing mill. (07)

Q.3 (a) Explain the linear theory of viscoelasticity. Also write down the importance of linear viscoelasticity in mixing of rubber. (07)

(b) Discuss the relationship between the memory and viscoelasticity. (07)

OR

Q.3 (a) Explain the concept of rubber elasticity by following the first law of thermodynamics. (07)

(b) Explain the stress softening behavior of gum rubber and compare it with filler loaded vulcanizate. (07)

Q.4 (a) Discuss in detail about different aspects for ease of mixing fillers. (07)

(b) Write about the Nano and molecular scale of mixing. (07)

OR

Q.4 (a) Explain in detail about the Structure of aggregate & agglomerate. (07)

(b) Discuss about the Optimum state of elastomers for mixing. (07)

Q.5 (a) Give the difference between the Flow mechanisms in Extruder & in Injection Molding Machine. (07)

(b) Justify the requirements & constraints imposed for material testing. (07)

OR

Q.5 (a) Short note on “Continuous Mixing.” (07)

(b) Discuss the different aspects for uniformity of Compound testing. (07)
