

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 1724002

Date: 18-06-2014

Subject Name: Rubber Blends

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 mark.**

Q. 1 (a) Answer the following. (08)
(i) Discuss the role of interfacial tension & phase morphology for affecting blend properties.

(ii) Give difference between Chemical Staining & Chemical Etching.

(b) Answer the following. (06)

(i) Write about the different techniques used for estimating crosslink densities in vulcanized blends.

(ii) Describe the characteristics of different types of Microscopy.

Q. 2 (a) Discuss about the estimation of Crosslink Density by solid state NMR Spectroscopy of NR. (07)

(b) Write in brief about cure system of NR/NBR41 blends. (07)

OR

Q. 2 (b) Answer the following.

(i) Justify the role of MG30 rubber as a compatibilizer in NR/NBR blends. (04)

(ii) Write the different methods for blending NR, MG30 & NBR. (03)

Q. 3 (a) Explain in detail about the effect of Polychloroprene content on crosslink distribution & physical properties. (07)

(b) List the constraints forced upon the dynamic cure system of NR/EPM blends. (04)

(c) Write about the importance of NR/EPM Blends. (03)

OR

Q. 3 (a) Discuss about Dynamic Vulcanisation of Clay-filled NR/EPM blends. (07)

(b) Which type of blends suitable for food application? Discuss the compounding of these types of blends in detail. (07)

Q. 4 (a) Explain about the modification of different EPDM grades & also discuss the interaction of modified EPDM & Carbon Black. (07)

(b) How to improve the resistance to low temperature crystallization in NR/ENR-25 blends? Discuss in detail. (07)

OR

Q. 4 (a) Explain in detail about the Effect of EPDM modification on Crosslink density. (07)

(b) Short note on $\bar{n}$ Cure system of NR/ENR-25 Blends. (07)

Q. 5 (a) Write down the characteristics of the types of microscopy. Explain in detail by TEM micrograph of a 60:40 NR: EPDM blend, filled with calcium carbonate, stained with osmium tetroxide based case study. (07)

(b) Write the compounding method for initial preparation & assessment of NR/EPDM based blend. (07)

OR

Q. 5 Describe the different approaches to improving NR/EPDM blend properties. (14)
