*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.**

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|---|---|---|---|
| **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 compatibalizer 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 ñCure system of NR/ENR-25 Blendsò. | **(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)** |

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