

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 132602****Date: 07-12-2013****Subject Name: Rubber Technology****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 Answer the following. **(14)**

- (i) List the name of principal regions of mature trunk of the Hevea Brasiliensis tree.
- (ii) Write the function and importance of 'Lignin' as a natural polymer.
- (iii) Write the characteristics of C-C bond in polymer structure.
- (iv) What do you mean by thermal Re-Randomization during orientation process?
- (v) Why Teflon is having excellent thermal stability?
- (vi) Explain the following terms:-(i) adsorbent (ii) adsorbate.
- (vii) Write the reaction mechanism for Lactonitrile Process.

Q. 2 (a) List the impurities remaining from the polymerization reaction. Explain any three in detail. **(07)****Q. 2 (b)** Draw the structure of the Hevea Brasiliensis seed and its mode of germination. Explain it in detail. **(07)****OR****(b)** Define the term "Tapping". Explain the processing of NR latex after tapping. **(07)****Q. 3 (a)** Give the classification of protein. Explain their importance as a natural polymer. **(07)****(b)** Draw the Schematic diagram showing axes of orientation. Discuss it in detail. **(07)****OR****Q. 3 (a)** Describe the chemical structure of cellulose. Explain the xanthate process for regeneration of cellulose. **(07)****(b)** Explain the following terms: (i) Cold stretching (ii) Wet Stretching. **(07)****Q. 4 (a)** List the process for Synthesis of Vinyl Acetate monomer. Explain any one process with reaction mechanism. **(07)****(b)** Discuss the mechanism of oxidative degradation. **(07)****OR****Q. 4 (a)** Write the characteristics of styrene monomer. Discuss about its synthesis by oxidation process with reaction mechanism. **(07)****(b)** Explain the polymer degradation involving substituent groups with the help of suitable example. **(07)****Q. 5 (a)** Discuss the effects of following determinates on polymer crystallinity: (i) Polar group (ii) substituent group (iii) Plasticizer. **(07)****(b)** Answer the following.**(i)** Explain the formation of porous structure of polymers by thermal treatment. **(03)****(ii)** Write the four major reactions in phenolic chemistry. **(04)****OR****Q. 5 (a)** List the factors affecting Tg of polymer. Explain any two in detail. **(07)****(b)** Answer the following.**(i)** Define the term: "Porosity". List parameters for estimation of porosity in polymer. **(03)****(ii)** Give the structure of amino resin. Write the advantage & disadvantage of amino resins over phenolic resins. **(04)**
