Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 132602 Date: 10-01-2013

Subject Name: Rubber Technology

Time: 10.30 am – 01.00 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 environmental conditions required for the growth of hevea brasiliensis tree.

(ii) Writ the application of following natural polymers (i) Lignin (ii)Shellac.

(iii) Discuss about the characteristics of C-H bond.

(iv) Write the synthesis reaction for the production of styrene monomer.

(v) Draw the diagram showing "atactic" and "isotactic" configurations in a vinyl polymer.

(vi) Give the first step reaction for synthesis of phenolic resins.

(vii) What do you mean by "porosity" of polymers?

Q. 2 **(a)** Show the diagram for successive stages of germination for Hevea brasiliensis seed and explain it in detail. **07**

(b) List the impurities remain in final polymer composition and explain its effects of any two on polymer property. **07**

OR

(b) List the monomeric additives introduced during compounding of polymer and explain the function of any two in detail. **07**

Q. 3 **(a)** Explain the viscose process to prepare regenerated cellulose in detail. **07**

(b) List the methods of orientation in polymer and explain any two in detail. **07**

OR

Q. 3 **(a)** Write the importance of protein as a natural polymer and write about the classification of protein. **07**

(b) Give the schematic diagram of axes of orientation and discuss in detail. **07**

Q. 4 **(a)** List the methods for production of acrylonitrile monomer and explain any two methods. **07**

(b) List the factors affecting polymer crystallinity and discuss about any two factors in detail. **07**

OR

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Q. 4 **(a)** Describe the Reppe process for manufacturing of Butadiene monomer. **07**

(b) Define the term" Glass transition temperature (Tg)". Discuss about any two factors affecting Tg of polymer. **07**

Q. 5 **(a)** List the basic types of polymer degradation .Discuss all in detail with schematic representation. **07**

	(b)	Answer the following.	
	(i)	Explain the one stage and two stage process for the production of phenolic resins.	**05**
	(ii)	Explain the mechanism of “Sorption” in brief.	**02**
		OR	
Q.5	**(a)**	Short note on “Oxidative degradation”.	**07**
	(b)	Answer the following.	
	(i)	Write about the properties and applications of Amino resins.	**05**
	(ii)	List the methods of forming porous structure in polymers.	**02**

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