Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER 2013

Subject Code: 142602 **Date: 12-06-2013**

Subject Name: Natural Rubber Science and Technology

Time: 10:30am – 01:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. 1	**(i).**	Why Natural Rubber is having excellent Tensile Strength?	**(14)**
	(ii).	List the types of Chemical modifications of Natural rubber.	
	(iii).	List the basic stages for the preparation of NR graft copolymer.	
	(iv).	Write the fundamental equation for Fick's first law of Diffusion theory.	
	(v).	What do you mean by low temperature crystallization in NR? Explain in bri .	
	(vi).	Show the diagram for Shear mounting to observe the Load – Deflection characteristics of bonded rubber components.	
	(vii).	Give the schematic diagram showing the network structure of Liquid Rubber.	
Q. 2	**(a)**	List the conventional grades of Natural Rubber. Explai y two in detail.	**(07)**
	(b)	Explain the Grafting chemistry with reaction mechanism for NR with Polystyrene.	**(07)**
		OR	
	(b)	List the basic grafting conditions for preparation of polystyrene grafted NR graft copolymer.	**(07)**
Q. 3	**(a)**	Give the schematic representation of water absorption del for vulcanized NR and discuss it in detail.	**(07)**
	(b)	List the methods for the preparation of Powdered Rubbe and explain any two methods in detail.	**(07)**
		OR	
Q. 3	**(a)**	Discuss the general features and affecting factors for Wax Blooming Phenomena in Rubber.	**(07)**
	(b)	"Powdered rubber technology is advantageous over Bale hnology in some respects." Justify the statement.	**(07)**
Q. 4	**(a)**	List the stages of low temperature crystallization in plain in detail.	**(07)**
	(b)	Draw the flow diagram of Reclaimator process and discu he process.	**(07)**
		OR	
Q. 4	**(a)**	Show the test piece geometries to perform strain and low temperature crystallization test for tensile, compression and shea and write their equations of Elastic Modulus (E).	**(07)**
	(b)	List the types of Reclaimed Rubber and explain all in ail.	**(07)**
Q. 5	**(a)**	Give Epoxidation reaction mechanism for NR and discuss the advantageous properties and applications of ENR.	**(07)**
(b)	**(i)**	List Environmental factors which affect the rubber during application. Explain about any one factor.	**(04)**
	(ii)	Explain about Liquid Polysulphide rubbers in brief.	**(03)**
		OR	
Q. 5	**(a)**	Write in detail about Degradation reactions for Natura Rubber.	**(07)**
(b)	**(i)**	Define the following terms : Buckling and Transmissibility.	**(04)**
	(ii)	Discuss about any one practical consideration affectin the development of telechelic polymers.	**(03)**

****