Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) EXAMINATION – SUMMER 2016

Subject Code:2142602 **Date:06/06/2016**

Subject Name:Natural Rubber Science & Technology

Time:10:30 AM to 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)
	1	State the first law of diffusion.	
	2	Why natural color of crepe rubber is pale yellow?	
	3	What is the function of partitioning agents for preparation of powdered rubbers?	
	4	What do you mean by Dynamic Devulcanization?	
	5	List the parameters on which grafting efficiency depends.	
	6	Write the equation showing relation between Young's Modulus and Compression Modulus.	
	7	List the basic types of Graft Co-Polymer.	
	8	Draw the network structure of Liquid rubber.	
	9	What will be the effect on diffusion coefficient if the temperature is increased?	
	10	Name the Non-Rubber Substance which affects the Modulus of Natural Rubber.	
	11	List the basic types of Reclaimed Rubber.	
	12	Give the name of chemical used to prepare Viscosity stabilized grade of Natural Rubber.	
	13	List the stages of low temperature crystallization in Natural Rubber.	
	14	Write any one advantage and Application of Epoxidized Natural Rubber (ENR).	
Q.2	(a)	Write about the methods to prepare Technically Specified Rubbers.	(03)
	(b)	Explain the phenomena of Storage hardening in Natural Rubber.	(04)
	(c)	Explain about Graft Co-polymer preparation by Direct mixing of two polymers.	(07)
		OR	
	(c)	Give the reaction mechanism for Polystyrene grafting on cis-1, 4 Polyisoprene and explain it.	(07)
Q.3	(a)	Derive the formula for measurement of Shear modulus during strain crystallization in Natural Rubber.	(03)
	(b)	Explain the low temperature crystallization process in terms of thermodynamics.	(04)
	(c)	Explain the effect of following parameters on diffusion of hydrocarbon liquids and oils in Natural Rubber: (i) Nature of rubber (ii) Compounding of Rubber	(07)
		OR	

Q.3	(a)	What do you mean by "Induction period" in low temperature crystallization process? Explain in brief.	(03)
	(b)	Draw the Compression test-piece geometry for measurement of Elastic modulus during crystallization process and explain it.	(04)
	(c)	Describe the general features of wax blooming.	(07)
Q.4	(a)	Write about flexible rubber-steel laminates.	(03)
	(b)	Give a brief note on 'Creep and Stress relaxation'.	(04)
	(c)	Discuss about the advantages of Powdered and Particulate rubbers.	(07)

OR

Q.4	(a)	Define the Term: "Hysteresis Loss". Write its practical significance.	(03)
	(b)	How the Puncture test is carried out? Explain with suitable diagram.	(04)
	(c)	Discuss about any two methods for preparation of Powdered rubbers.	(07)
Q.5	(a)	Write about classes of commercially established liquid elastomer.	(03)
	(b)	Write the purpose and types of the chemical modification of Natural rubber.	(04)
	(c)	Explain in detail about the Digester Process for preparation of Reclaimed rubber.	(07)

OR

Q.5	(a)	Write about the alternative method for achieving carbon black dispersion in liquid polybutadiene rubber.	(03)
	(b)	Write the chemical reaction for simple addition reaction of Polyisoprene chains in Natural rubber.	(04)
	(c)	Write a short note on 'Rubberized Asphalt'.	(07)

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