Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2143602 **Date: 06/06/2017**

Subject Name: Rubber Chemistry & Natural Polymers(Department Elective-II)

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Give monomer of Epoxy Resin?	
	2	Draw structure of NR.	
	3	What is IIR?	
	4	Best use of Neoprene?	
	5	What is Phenol formaldehyde resin?	
	6	Example of Plasticizer?	
	7	Give two examples of synthetic rubbers?	
	8	Give function of Fillers.	
	9	What is the importance of Antiozonants?	
	10	What is Functionality?	
	11	Give example of accelerators for curing.	
	12	Why vulcanization is Done?	
	13	Draw structure of NBR?	
	14	What is the value of Glass Transition Temp for NR?	
Q.2	**(a)**	Write chemical structures of following: Poly lactic acid, Butyl Rubber, EPDM.	**03**
	(b)	Write classification of Natural Polymers.	**04**
	(c)	What is vulcanization. Why it is being done? Write different methods for the same.	**07**
		OR	
	(c)	Compare and contrast between peroxide vulcanization and Sulphur vulcanization. What kind of system is used for EPM rubber?	**07**
Q.3	**(a)**	What is mastication? Is it required for synthetic rubber too?	**03**
	(b)	Write functions and examples of each: Antioxidants and Accelerator	**04**
	(c)	Give preparation, properties for a rubber best suited for storage of Petrol. Also write reactions involved.	**07**
		OR	
Q.3	**(a)**	Write a note on drawbacks of NR.	**03**
	(b)	What short notes on: Flouro elastomers & Polyester-amide.	**04**
	(c)	Draw flow sheet diagram for manufacturing of SBR. Explain its major properties and applications.	**07**
Q.4	**(a)**	Write short note on compounding and its importance.	**03**
	(b)	What is limited Olefin Functionality? Write its significance.	**04**

	(c)	What are polyurethanes? Write synthesis and are their major applications? Also mention major industries which produces PUs.	**07**

OR

Q.4	**(a)**	Write a note on Biopolymers.	**03**
	(b)	Suggest rubber for Inner Liner application and also explain its manufacturing.	**04**
	(c)	Write a detailed note on polyamides. Explain with chemical reactions and uses.	**07**
Q.5	**(a)**	Explain need and scope for synthetic rubbers.	**03**
	(b)	Write short note on: Chitin & Chitosan	**04**
	(c)	Write chemistry for epoxy and amino resin. Write their significance.	**07**

OR

Q.5	**(a)**	Write a note on modification of natural rubber and natural polymers.	**03**
	(b)	Write short notes on following: Starch & cellulose.	**04**
	(c)	Write Chemistry for polyester resin and alkyd resins. Explain their wide range of applications.	**07**

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