Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2143602 Date:03/06/2016

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	What is NR chemically?	
	2	Draw structure of IIR.	
	3	Monomer of Epoxy Resin?	
	4	Best use of Nitrile rubber?	
	5	What is Bakelite?	
	6	What is the value of Tg for Natural Rubber?	
	7	Give two examples of natural Polymers?	
	8	Give example of Fillers.	
	9	What is the function of antioxidant?	
	10	Define Functionality.	
	11	Give example of Activator for vulcanization.	
	12	Why curing is Done?	
	13	Structure of EPDM?	
	14	Give example of Plasticizer?	
Q.2	**(a)**	Write chemical structures of following: Nitrile Rubber, SBR, Chloroprene	**03**
	(b)	Explain drawbacks of NR and Application of synthetic rubbers	**04**
	(c)	Explain compare and contrast between peroxide and Sulphur vulcanization.	**07**
		OR	
	(c)	How is polyester resin different from alkyd resins? Explain with chemical reaction.	**07**
Q.3	**(a)**	Write down the Classification of Natural Polymers.	**03**
	(b)	What is polyester-amide? How ester-amide ratios effect the properties of PEA?	**04**
	(c)	Give examples of natural polyester and natural polyamide. Explain with chemical reaction	**07**
		OR	
Q.3	**(a)**	How natural rubber is obtained, write its detailed process of preservation and coagulation.	**03**
	(b)	Write down various techniques of polymerization.	**04**
	(c)	Why diene is added to EPM rubber? Explain its properties and major applications.	**07**
Q.4	**(a)**	Explain mastication, compounding and curing.	**03**
	(b)	Why modification is important for natural polymers and rubbers? Explain with example	**04**

	(c)	How E and S-SBR are different. Write their manufacture process in detail.	**07**

OR

Q.4	**(a)**	Which polymer is widely used for bio-medical applications? Explain its synthesis.	**03**
	(b)	What is Neoprene? Write a note on manufacturing of Neoprene including synthesis of its monomer.	**04**
	(c)	Suggest a ozone resistant rubber, its preparation and reactions involved.	**07**
Q.5	**(a)**	Explain synthesis of Saturated and unsaturated Polyester.	**03**
	(b)	Suggest a Rubber for the making of linning of Tank used for Petrol. State its manufacturing process and other applications also.	**04**
	(c)	Write about the raw materials and chemical reactions for epoxy and amino resin	**07**

OR

Q.5	**(a)**	Write in detail preparation and uses of PU.	**03**
	(b)	Write short notes on following: Proteins, starch, lignin & cellulose	**04**
	(c)	Write notes on any two: Hypalon, Natural Rubber preservation, limited olefinic functionality	**07**

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