Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 162602 **Date: 28-11-2014**

Subject Name: Synthetic Rubbers

Time: 02:30 pm - 05:00 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)	Write any two molecular requirements for rubbery behavior in Polymers.	
	(ii)	Why Metal Oxides are essential in compounding of Fluoro Elastomers?	
	(iii)	Write the importance of optimum Chlorine content in synthesis of Hypalon Elastomers and give its value.	
	(iv)	Name the rubber used for manufacturing of soft contact lenses and explain its chemistry.	
	(v)	Write the reaction mechanism for production of Polynorbonene.	
	(vi)	How Epichlorohydrin Copolymer is differing from Epichlorohydrin Homopolymer?	
	(vii)	List the basic grades of Thiokol rubber and write the difference between them.	
Q. 2	(a)	Draw the flow diagram for production of Polybutadiene rubber and explain the process in detail.	**(07)**
Q. 2	(b)	Short note on Carbon black master batch Styrene Butadiene Rubber.	**(07)**
		OR	
	(b)	Discuss about the effects of Styrene/Butadiene ratio on properties of Styrene Butadiene Rubber.	**(07)**
Q. 3	(a)	Explain the effect of monomer proportion on Nitrile rubber properties and list the grades of varying monomer proportions.	**(07)**
	(b)	"Silicon rubber is of versatile characteristics synthetic rubber." Justify the statement.	**(07)**
		OR	
Q. 3	(a)	List the possible blends of Nitrile rubber with other polymers and explain it.	**(07)**
	(b)	Discuss about the mixing operation, processing problems and their remedies for Silicon rubber.	**(07)**
Q. 4	(a)	Write a detail note on production of butyl rubber with flow diagram.	**(07)**
	(b)	Answer the following.	
	(i)	Write about basic catalyst systems and their importance for synthesis of Isoprene rubber.	**(04)**
	(ii)	Give the abbreviation and structure for repeat unit of Polyacrylic rubbers.	**(03)**
		OR	
Q. 4	(a)	Describe the chemistry of halogenated Butyl rubber and write its advantages over conventional Butyl rubber grades.	**(07)**
	(b)	Answer the following.	
	(i)	List the inferior and superior properties of Isoprene rubber with respect to Natural rubber.	**(04)**
	(ii)	Write the name of monomers and structure of Propylene Oxide rubber (GPO).	**(03)**
Q. 5	(a)	Which characteristics are required for third monomer used in synthesis of Ethylene Propylene Diene Methylene Rubber (EPDM)? Write their name, structure and give comparison between them.	**(07)**
	(b)	Discuss in detail about chemistry and vulcanization of Chloroprene rubber.	**(07)**

OR

Q. 5	(a)	Write about beneficial properties and major applications of Ethylene Propylene Diene Methylene Rubber (EPDM).	**(07)**
	(b)	Explain about the basic grades of Neoprene and their advantages in detail.	**(07)**

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