Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem-VI Examination May 2011
Subject code: 162602
Subject Name: Synthetic Rubbers

Date:17/05/2011 **Time: 10.30 am – 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)**

(i) Define the term:" Sulfur rank" How it is important for Thiokol rubbers?
(ii) How acrylic rubbers are obtained? Represent the structural repeat unit of acrylic rubbers.
(iii) Write the chemical name and structure of Hypalon.
(iv) Write any two principal properties and applications of Viton.
(v) In which respect Epichlorohydrin copolymer (ECO) is differ from homopolymer(CO) (according to properties) ?
(vi) List the principal properties of Propylene oxide rubbers (GPO).
(vii) Write any four key properties of Ethylene Methyl Acrylate Rubbers (AEM).

Q.2 **(a)** Explain the chemical structure of Acrylonitrile butadiene rubber (NBR) and write about the effects of Acrylonitrile content on properties of Nitrile rubber. **(07)**

(b) Explain about the production of Chloroprene rubber (CR) by Sulfur modified process. **(07)**

OR

(b) List the effects of polymerization temperature upon the character of Chloroprene rubber (CR) and explain any two effects in detail. **(07)**

Q.3 **(a)** Explain the characteristics of Polybutadiene rubber (PBR). **(07)**

(b) Explain the technology of Isoprene rubber and explain the difference between Natural rubber (NR) and Isoprene rubber.(IR) **(07)**

OR

Q.3 **(a)** List the name and structure of basic stereoregular forms of Polybutadiene rubber(PBR) and explain the influence of this structure on properties of Butadiene rubber. **(07)**

(b) List the principal catalyst system used for Isoprene rubber (IR) and explain it in detail. **(07)**

Q.4 **(a)** Answer the following.

(i) Write the name and structure of any two Diene monomer used for Ehylene Propylene Diene Methylene Rubber (EPDM) Production. **(02)**
(ii) Explain the importance of Diene monomer in EPDM .Explain the structural and characteristic requirement for this diene monomer for EPDM. **(05)**

(b) List the basic methods used for vulcanization of isoprene isobutylene rubber (IIR) explain the methods in detail. **(07)**

OR

Q.4 **(a)** Explain the effects of Ethylene to Propylene ratio (E/P ratio) on properties of Ethylene Propylene Dine methylene Rubber (EPDM) in detail. **(07)**

(b) Explain in detail about production of Isoprene Isobutylene Rubber (IIR). **(07)**

Q.5	**(a)**	List two basic production method for emulsion polymerized Styrene Butadiene Rubber (SBR). Explain anyone in detail with flowchart.	**(07)**
	(b)	Answer the following.	
	(i)	Write the structure of silicon rubber (Q). Explain its chemistry in brief.	**(03)**
	(ii)	What do you mean by crepe hardening? Explain the methods to overcome this problem in silicon rubber.	**(04)**

OR

Q.5	**(a)**	Short note on Oil extended styrene butadiene rubber (OESBR).	**(07)**
	(b)	Explain the principle properties of silicon rubber in detail.	**(07)**

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