

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3162607****Date:17-05-2024****Subject Name:High Performance Elastomers****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1 (a) Justify the Hydrogenated Nitrile rubber as a High Performance Elastomer. (03)  
 (b) Write about catalytic Hydrogenation for Nitrile rubber with reaction mechanism. (04)  
 (c) Describe the effect of RDB level on properties of Hydrogenated Nitrile Rubber. (07)
- Q.2 (a) How Vamac is different than other Acrylic Elastomers in terms of properties? (03)  
 (b) Give synthesis reaction for Vamac. (04)  
 (c) Describe the Reed process for production of Hypalon. (07)
- OR
- (c) Draw the structure of Chlorosulfonated Polyethylene (CSM). Write about its chemical composition and rubberiness. (07)
- Q.3 (a) Write in brief about processing of Fluoro Elastomers. (03)  
 (b) Write about the major difference between chemical composition of Fluoro Elastomers (FKM) and Perfluorocarbon Elastomer (FFKM). (04)  
 (c) Mention basic stages for crosslinking process of Fluoro Elastomers and give reaction mechanism showing the curing process. (07)
- OR
- Q.3 (a) Write the significance of Metal Oxide in compounding of Fluoro Elastomers. (03)  
 (b) Give synthesis reaction for Perfluorocarbon Elastomer. (04)  
 (c) Name various monomers for synthesis of Fluoro rubbers. Draw the structures and write about Flourine content of different FKM Elastomers. (07)
- Q.4 (a) Mention the structural formula of a Chlorine containing Polyacrylic Elastomer. (03)  
 (b) Write about curing system and plasticizers for Acrylic Elastomers. (04)  
 (c) Describe the effect of Vinyl Acetate content on EVA copolymer with appropriate graphical representation. (07)
- OR
- Q.4 (a) Draw the structures for cure site monomers of Acrylic Elastomers. (03)  
 (b) Explain about characteristics of various monomers used for Acrylic rubbers. (04)  
 (c) Give synthesis reaction for EVA Elastomer. (07)  
 Mention its basic types, properties and applications.
- Q.5 (a) Give difference between Epichlorohydrin copolymer and terpolymer in terms of properties. (03)  
 (b) Give synthesis reaction for Epichlorohydrin Copolymer (ECO). (04)  
 (c) Describe the composition of Thiokol A. Mention its synthesis reaction and properties. (07)
- OR
- Q.5 (a) Mention the effect of the presence of ether oxygen group on Epichlorohydrin rubbers. (03)  
 (b) Write about important properties and applications of Epichlorohydrin rubbers. (04)

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