

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162607****Date:06-07-2023****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) List the differences between High Performance Elastomers and General purpose Elastomers. (03)
(b) Give reaction mechanism for synthesis of Hydrogenated Nitrile Rubber. Write its advantages over Nitrile Rubber. (04)
(c) Describe the effect of Hydrogenation percentage on properties of Acrylonitrile Butadiene Rubber. (07)
- Q.2** (a) List the properties and applications of Flouro Elastomers. (03)
(b) Mention the metal oxides used in compounding of Viton. Why it is required? (04)
(c) Name the monomers used for synthesis of Flouro Elastomers and draw their structures. (07)
- OR**
- (c) Describe the curing systems used for Flouro Elastomers. (07)
- Q.3** (a) Give reaction mechanism for synthesis of EVA. (03)
(b) Mention the monomer proportion range for elastomeric behaviour of EVA. Write the basic types of EVA elastomers. (04)
(c) Give the general synthesis reaction for Polysulfide rubber. Write about its advantages and limitations. (07)
- OR**
- Q.3** (a) List the properties and applications of EVA rubber. (03)
(b) Write in brief about relationship between Tg and copolymer composition of EVA rubber with graphical representation. (04)
(c) Describe in detail about basic grades of Polysulfide rubber and write about differences among them. (07)
- Q.4** (a) Give the abbreviation for Ethylene-Acrylic rubber. Write its major applications. (03)
(b) Write about properties of Ethylene-Acrylic rubber vulcanizates. (04)
(c) Name the monomers used for synthesis of Acrylic rubbers and also draw their structures. (07)
- OR**
- Q.4** (a) Give differences between Polyacrylate rubber (ACM) and Ethylene-Acrylic rubber. (03)
(b) Write about compounding of Ethylene-Acrylic rubber. (04)
(c) Mention the cure site monomers used for synthesis of ACM Elastomers with structures and write about its curing system. (07)
- Q.5** (a) Write the value of optimum chlorine content and optimum sulfur content for CSM elastomer. (03)
(b) How rubberiness is derived in Chlorosulfonated Polyethylene? Explain in brief. (04)
(c) Explain the effect of ether oxygen group in properties of Epichlorohydrin Elastomers. (07)

OR

- Q.5** (a) Draw the structure of Chlorosulfonated Polyethylene. Write its important characteristics. **(03)**
- (b) Write about the opposing effects of Chlorine group in Hypalon. **(04)**
- (c) Describe the basic grades of Epichlorohydrin rubber with their synthesis mechanism. **(07)**
