

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)**

- Write any two molecular requirements for rubbery behavior in Polymers.
- Why Metal Oxides are essential in compounding of Fluoro Elastomers?
- Write the importance of optimum Chlorine content in synthesis of Hypalon Elastomers and give its value.
- Name the rubber used for manufacturing of soft contact lenses and explain its chemistry.
- Write the reaction mechanism for production of Polynorbornene.
- How Epichlorohydrin Copolymer is differing from Epichlorohydrin Homopolymer?
- 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)**
