

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014

Subject Code: 162602

Date: 21-05-2014

Subject Name: Synthetic Rubbers

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) Explain the term "Carboxylated Rubbers".
 - (ii) List the basic types of Thiokol rubber. Give the difference between them.
 - (iii) Write the two important types of fluoro carbon elastomers.
 - (iv) Give the synthesis reaction for Acrylonitrile Butadiene Rubber.
 - (v) Write the synthesis reaction of polynorbonene rubber. Name the polymerization method used.
 - (vi) List the types of Epichlorohydrin Rubber and give comparisons between them.
 - (vii) Write properties and applications of neoprene.
- Q. 2** (a) Discuss the chemistry of Nitrile rubber and explain the influence of monomer ratio on properties of NBR. **(07)**
- (b) Answer the following.
- (i) Draw the flow sheet for the manufacturing process of Styrene Butadiene Rubber (SBR) by batch process. **(04)**
 - (ii) Give comparison between Hot SBR & Cold SBR. **(03)**
- OR**
- (b) Explain the manufacturing process of Oil Extended Styrene Butadiene Rubber (OESBR) and write its advantages. **(07)**
- Q. 3** (a) Draw the flow sheet for the manufacturing process of Neoprene Rubber and discuss all in detail. **(07)**
- (b) Draw the structure of Diene Monomers used in synthesis of EPDM rubber and Explain their chemistry. **(07)**
- OR**
- Q. 3** (a) "Polymerization Temperature is an important variable during manufacturing of Chloroprene Rubber by Emulsion polymerization." Justify the statement. **(07)**
- (b) Write short note on vulcanization of EPDM. **(07)**
- Q. 4** (a) Describe all the methods for vulcanization of Isobutene Isoprene Rubber (IIR). **(07)**
- (b) Explain the manufacturing process of Synthetic Natural Rubber with flow sheet. **(07)**
- OR**
- Q. 4** (a) Draw the flow sheet for the manufacturing process of Butyl Rubber and Explain the process. **(07)**
- (b) Explain the technology of Isoprene Rubber (IR). **(07)**
- Q. 5** (a) Draw the flow diagram for cis-1,4 Polybutadiene by solution polymerization method and explain the process in detail. **(07)**
- (b) "Silicone Rubber is a versatile rubber" Justify the statement. **(07)**
- OR**
- Q. 5** (a) Discuss the basic advantages and limitations of Polybutadiene rubber (PBR). **(07)**
- (b) Discuss the production of Silicone Rubber by giving reaction mechanisms and process flowsheet. **(07)**
