

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV • EXAMINATION – WINTER 2013

Subject Code: 143602**Date: 26-12-2013****Subject Name: Rubber Chemistry and Natural Polymers****Time: 02:30 pm to 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 (a)** Answer the following questions : **07**
- (i) Explain what vulcanization is?
 - (ii) Write full form of IIR.
 - (iii) What are special properties of Polychloroprene?
 - (iv) What are the monomers of Buna-N?
 - (v) Write Chemical Name of Natural Rubber.
 - (vi) Write names of some natural polymers.
 - (vii) What are the monomers for the production of polyurethanes?

- (b)** Match the following **07**

A

- a) Buna –S
- b) EPDM
- c) Natural Rubber
- d) Sucrose
- e) IIR
- f) Protein
- g) Starch

B

- i) Limited Olefin Functionality
- ii) Biopolymer
- iii) Poly isoprene
- iv) Butyl Rubber
- v) Polysaccharide
- vii) SBR
- viii) Disaccharide

- Q.2 (a)** Write in detail preparation, properties and uses of NBR. **07**

- (b)** Explain in detail rubber compounding and role of different compounding ingredients. **07**

OR

- (b)** Write short notes on any two monomers including its synthetic routes **07**
- a) Butadiene b) ACN c) Isobutylene d) Isoprene

- Q.3 (a)** Explain Conventional, Semi Efficient and Efficient Sulphur Vulcanization. **07**

- (b)** Write note on the disaccharides and polysaccharides with examples and structures? **07**

OR

- Q.3 (a)** Explain in detail with chemical reactions of ozonolysis method to confirm the structure of natural rubber. **07**

- (b)** Write a detailed note on the production of SBR , its properties and important applications. **07**

- Q.4 (a)** What is natural rubber , write its chemical structure? Write the typical composition of Natural Rubber Latex extracted from tree? **07**

- (b)** Explain hot and cold emulsion polymerization. Write important ingredients used in emulsion polymerization. **07**

OR

- Q.4** (a) Write a detailed note on the production ,properties and application of Polychloroprene. **07**
(b) Write in detail including chemical reactions for the preparation of Chitosan from chitin and its important applications. **07**
- Q.5** (a) Write general reaction scheme for making polyurethanes. Also write important usage of polyurethanes. **07**
(b) What are biopolymers, explain with examples, their classification, types, usage and environmental benefits. **07**
- OR**
- Q.5** (a) Write a detailed note on production, properties and usage of Butyl Rubbers. **07**
(b) Write notes on any two **07**
i) Rubber Tapping
ii) EPDM
iii) Synthetic Polyisoprene
iv) Cellulose and its derivatives
