

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2132602****Date: 11/06/2019****Subject Name: Rubber Technology****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) Draw the chemical structure of starch and give its natural sources. **03**  
 (b) Write in brief about 'Lignin' and 'Humus'. **04**  
 (c) Draw the principal regions of mature trunk of the Hevea brasiliensis tree and explain it in detail. **07**
- Q.2** (a) Write about warm stretching. **03**  
 (b) What is the relation between orientation and crystallization? Describe it in brief. **04**  
 (c) Explain in detail about the effect of 'impurities remain from the original polymerization reaction' on properties and applications of final polymer. **07**
- OR**
- (c) Discuss in detail about the importance of Hydrogen element in polymer chemistry. **07**
- Q.3** (a) Write about Homochain and Heterochain polymers. **03**  
 (b) Draw the schematic representation of different types of copolymer structures. **04**  
 (c) Discuss about the factors influencing the glass transition temperature ( $T_g$ ). **07**
- OR**
- Q.3** (a) Define the term 'Organic polymer' and 'Inorganic polymers' with suitable example. **03**  
 (b) Describe linear, branched and cross-linked polymers. **04**  
 (c) Write a short note on thermal transitions in polymers. **07**
- Q.4** (a) Differentiate the terms 'sorbate' and 'sorbent'. **03**  
 (b) Describe any two methods of forming porous structure of polymers. **04**  
 (c) List the processes to produce butadiene monomer and explain any one in detail. **07**
- OR**
- Q.4** (a) What do you mean by porosity in polymers? Write about the method of its estimation. **03**  
 (b) Describe the mechanism of sorption of inert sorbates on polymers. **04**  
 (c) Explain in detail about production of styrene by dehydrogenation of ethylbenzene. **07**
- Q.5** (a) Describe the properties and uses of rigid foam. **03**  
 (b) Write about different applications of amino resins. **04**  
 (c) Write a short note on oxidative degradation of polymers. **07**
- OR**
- Q.5** (a) Which are the different ways to apply alkyd resins in surface coatings? **03**  
 (b) Discuss about the properties and uses of unsaturated polyester resins. **04**  
 (c) Explain in detail about the types of polymer degradation with their characteristics. **07**

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