

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3152610****Date:01/02/2021****Subject Name:Polyurathene Technology****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Give the Urethane-reaction mechanism for synthesis of flexible Polyurethane foam. (03)
- (b) Write about the significance of surfactants for the production of PU foams. (04)
- (c) Explain about waste management and environment regulation for solid PU foam. waste. (07)
- Q.2** (a) Mention various applications of slabstock foams. (03)
- (b) List out the major groups and their sub groups for flexible slabstock foam according to chemical structure. (04)
- (c) Describe the process operations and reaction zones for the production of slabstock foams with schematic representation. (07)
- Q.3** (a) List the basic requirements for manufacturing of PU buns. (03)
- (b) Write about the effect of cell gas on Thermal conductivity of PU foam. (04)
- (c) Explain in detail about continuous production of laminating PU rigid foam. (07)
- Q.4** (a) Give the advantages and disadvantages of Shell method for laminating panels. (03)
- (b) Write about dependence of Thermal conductivity on density of rigid PU foam. (04)
- (c) Mention the methods for manufacturing of pre-insulated pipes and explain it in detail. (07)
- Q.5** (a) List out the different types of Polyurethane. (03)
- (b) Write a brief note about Polyol. (04)
- (c) Discuss the Basic Structure of Polyurethane Elastomers with example and explain prepolymer route for formation of Polyurethane Elastomers. (07)
- Q.6** (a) List out the compounding ingredients used in the manufacturing of Polyurethane. (03)
- (b) Draw the Structure of Urethane link and Polyurethane. (04)
- (c) Discuss the basic chemistry of Polyurethane with suitable examples. (07)
- Q.7** (a) Give the difference between Hydrolysis and Hydrolytic stability. (03)
- (b) List out the design guidelines used for Injection molded polyurethane parts. (04)
- (c) Explain in detail about manufacturing of Diisocyanates with example. (07)

- Q.8**
- (a) List out the different types of Physical Blowing agent used in Polyurethane foam manufacturing process. **(03)**
 - (b) Give the comparison of physical properties of water as a blowing agent and boric acid as a blowing agent. **(04)**
 - (c) Discuss in detail about Chain Extender used in Polyurethane manufacturing process. **(07)**

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