

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - VII EXAMINATION - WINTER 2025

Subject Code: 3172608

Date: 01-12-2025

Subject Name: Rubber Adhesion and Adhesion Science

Time: 10:30 AM TO 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.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) State the difference between adhesive and Adhesion.	03
(b) Short note on: “Mastics”.	04
(c) Discuss the functions of resins in elastomer-based adhesives with suitable examples.	07
Q.2 (a) Give the classification adhesives based on application.	03
(b) Name the types of stresses and types of adhesive joints commonly considered in adhesive bonding. Support your answer with neat sketches of their design.	04
(c) List out the important factors for selection of adhesives. Explain it in detail.	07
OR	
(c) List the testing methods used for Rubber adhesive. Explain any one in detail.	07
Q.3 (a) Give the difference between the Solvent based and Latex based Adhesives.	03
(b) Draw the Natural rubber Latex formulation for the Quick Grab Adhesive.	04
(c) Describe the compounding ingredients used for Nitrile Rubber Adhesives in detail.	07
OR	
(a) List the types of solvents in which nitrile rubber is soluble and insoluble.	03
(b) Explain the importance and applications of Nitrile Rubber–Phenolic Adhesives.	04
(c) List the principal additives used in non-vulcanising Natural Rubber adhesives and explain their functions in detail.	07
Q.4 (a) Give the classifications of SBR latex.	03
(b) Illustrate the formula of SBR-based adhesive and explain its application in ceramic tile bonding.	04
(c) Explain the role of compounding ingredients and their interaction with phases in Thermoplastic Rubber formulations.	07
OR	
(a) List out the useful functions of the plasticizers in thermoplastic rubber-based adhesive.	03

- (b) Explain how thermoplastic elastomer adhesives are protected against degradation during processing and service life. 04
- (c) Discuss the compounding of SBR rubber-based adhesives. List the major ingredients used in addition to the elastomer and explain their specific functions. 07
- Q.5** (a) Give the difference between the Anionic and Nonionic types Neoprene Latexes. 03
- (b) Explain how the polymer structure of neoprene affects its adhesive properties. 04
- (c) Discuss the mixing and processing techniques for Butyl rubber and Polyisobutylene adhesives. 07

OR

- (a) Write the advantages and applications of Butyl rubber adhesives. 03
- (b) Elaborate on the techniques to modify the cohesive strength in Polyisobutylene adhesive. 04
- (c) Explain the Direct Dissolving process used for preparing Neoprene-based adhesives. 07
