

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:3172608****Date:16-12-2024****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.

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| Q.1 | (a) | Write the significance of solubility parameter. | 03 |
| | (b) | Summarize the advantages of adhesive bonding. | 04 |
| | (c) | Classify the organic, semiorganic and inorganic adhesives in detail. | 07 |
| Q.2 | (a) | State the difference between the adhesive and cohesive. | 03 |
| | (b) | What are the role of Diluents in Epoxy Resin Adhesives? | 04 |
| | (c) | What are the common fillers and additives used in cyanoacrylate adhesives, and how do they influence adhesive properties? | 07 |
| OR | | | |
| | (c) | Name the types of Epoxy Resin. Explain any one in detail. | 07 |
| Q.3 | (a) | What is the effect of rubber plasticity on tack? | 03 |
| | (b) | Draw the Natural rubber latex formulation for the Self Adhesive Envelopes. | 04 |
| | (c) | Describe about the compounding for Styrene Butadiene Rubber Adhesives. | 07 |
| OR | | | |
| Q.3 | (a) | Write the benefits of SBR Latexes. | 03 |
| | (b) | Why are colloid stabilizers added in SBR water-based adhesives, and what are the three main classes of these stabilizers? | 04 |
| | (c) | Explain in detail about the non-vulcanizing Natural rubber based adhesive. | 07 |
| Q.4 | (a) | What advantages does Vinsol resin offer when used with nitrile latices? | 03 |
| | (b) | Short note on: “Nitrile rubber/ Phenolic adhesives”. | 04 |
| | (c) | Name the curing systems for Butyl rubber adhesive. Explain any one in detail. | 07 |
| OR | | | |
| Q.4 | (a) | Write the properties of Butyl rubber in adhesive applications. | 03 |
| | (b) | How can cohesive strength be modified through proper polymer selection in Polyisobutylene (PIB) adhesive systems? | 04 |
| | (c) | Describe the compounding of Nitrile Rubber Adhesives in detail. | 07 |
| Q.5 | (a) | How to select a Plasticizer for Thermoplastic rubber High Performance Adhesives? | 03 |
| | (b) | Draw the thermoplastic elastomer adhesive formulation with their ingredients importance for the pressure sensitive adhesive application. | 04 |
| | (c) | List the techniques which are commonly used to prepare Neoprene Rubber adhesives. Explain any one in detail. | 07 |
| OR | | | |
| Q.5 | (a) | “Metal oxides serve several functions in Neoprene adhesives” Justify the statement. | 03 |
| | (b) | Short note on: “Anionic Type Neoprene Latex Based Adhesives”. | 04 |
| | (c) | How are resins categorized based on their interaction with different phases in thermoplastic rubber? Explain in detail. | 07 |
