

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3173622****Date:19-12-2023****Subject Name: Sophisticated Testing of Polymers and Rubbers****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

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|------------|---|-----------|
| Q.1 | (a) Define following standards: i) BS ii) ASTM iii) AISI | 03 |
| | (b) Write a short note on: 1. Standards 2. Specifications | 04 |
| | (c) What are the physico chemical properties of polymer? Give their relationships with other properties and its significance? | 07 |
| Q.2 | (a) What is the difference between ODR and MDR? | 03 |
| | (b) Explain Mass Spectrometry with its significance in Polymer Characterizations? | 04 |
| | (c) Enlist the different types of standards used in industries? Give the points to remember when using standards? | 07 |
| | OR | |
| | (c) With working principle, mechanism, neat sketch and polymer based applications, explain TGA? | 07 |
| Q.3 | (a) Define in brief: Resonance spectrometry | 03 |
| | (b) Explain in brief about Gas chromatography. | 04 |
| | (c) With working principle, mechanism, neat sketch and polymer based applications, explain IR Spectroscopy? | 07 |
| | OR | |
| Q.3 | (a) Define : storage modulus, loss modulus and $\tan\delta$ | 03 |
| | (b) Write a short note on vicat softening temperature. | 04 |
| | (c) What is Tg of a polymer? How to determine it? | 07 |
| Q.4 | (a) What do you mean by impact resistance? | 03 |
| | (b) Explain the practical significance of X-Ray Diffraction Technique in testing polymer samples? | 04 |
| | (c) What is UV Spectroscopy? Explain it with proper schematic and principle of working? | 07 |
| | OR | |
| Q.4 | (a) What do you mean by limiting oxygen index? | 03 |
| | (b) Explain in brief about tear testing of polymers. | 04 |
| | (c) What is XRD? How it is beneficial in polymer characterization? | 07 |
| Q.5 | (a) Explain in brief about refractive index. | 03 |
| | (b) What do you mean by stress cracking? | 04 |
| | (c) Write a detailed note on DSC. | 07 |
| | OR | |
| Q.5 | (a) Enlist different electrical and mechanical properties of polymer. | 03 |
| | (b) What are the different material characterization tests? | 04 |
| | (c) Explain the basic principle and working of UTM. | 07 |