

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2173603****Date: 15/11/2018****Subject Name: Evaluation & Testing of Polymers & Rubber****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.

MARKS

- | | | |
|------------|--|-----------|
| Q.1 | (a) Write a note on UTM. | 03 |
| | (b) Elaborate viscoelastic behavior of rubbers. | 04 |
| | (c) Explain Relative, Specific, Reduced, Inherent, Intrinsic Viscosity and Fatigue Resistance | 07 |
| Q.2 | (a) Explain Vicat softening temperature. | 03 |
| | (b) Describe method of determination of Melt Flow Index of Thermoplastic materials | 04 |
| | (c) Discuss XRD in detail. | 07 |
| | OR | |
| | (c) Write short note on: (i) Brookfield rheometer (ii) Cone and plate flow | 07 |
| Q.3 | (a) Define Impact resistance. Mention its usefulness. Also draw a typical stress-strain curve of: polystyrene, HIPS and natural rubber | 03 |
| | (b) Describe the method for determination of viscosity average molecular weight of polymers. | 04 |
| | (c) Write in details about the importance of testing of polymers and rubber. | 07 |
| | OR | |
| Q.3 | (a) Define : storage modulus, loss modulus and $\tan\delta$ | 03 |
| | (b) How is Hardness of polymer/rubber determined? Mention with Types | 04 |
| | (c) Draw instrumentation diagram of UV spectroscopy, write its principle and applications. | 07 |
| Q.4 | (a) Define glass transition temperature of polymers. Describe briefly method of determination of T_g | 03 |
| | (b) Explain DSC with Curve. | 04 |
| | (c) Explain limiting oxygen index with neat sketch | 07 |
| | OR | |
| Q.4 | (a) Explain following terms: breakdown voltage, Arc resistance | 03 |
| | (b) Write difference between melting temperature & softening temperature? | 04 |
| | (c) What information do you get from following test? Mention their usefulness in product design: DSC, Izod and Charpy test?. | 07 |

- Q.5 (a) Write short note on Weathering resistance **03**
www.FirstRanker.com www.FirstRanker.com
(b) Explain in detail about Thermo Gravimetric Analysis (TGA). **04**
(c) What are the major applications of UV, IR, and NMR spectroscopy? **07**

OR

- Q.5 (a) What is Smoke Toxicity Test? **03**
(b) Describe the working principle of GPC method used to determine Molecular Weight of Polymers **04**
(c) Define the following: **07**
Elongation-at-break, Strain, Ultimate tensile strength, Yield Strength, Proportional Limit, Modulus of Elasticity, Toughness.

www.FirstRanker.com