

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII EXAMINATION – WINTER 2015

Subject Code: 173603**Date: 04/12/2015****Subject Name: Evaluation and Testing of Polymers & Rubbers****Time: 10:30am to 1:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain the construction of the equipment used to test Melt Flow Index (MFI) and write the test method for the same in detail. **07**
- (b) Explain Cup Flow test in detail with its importance. **07**
- Q.2** (a) Mention the steps of Gel Permeation Chromatography with neat flow diagram for evaluating molecular weight of polymer. **07**
- (b) Explain Glass transition temperature (T_g) as thermal property of polymer along with sample preparation and conditioning of sample. **07**
- OR**
- (b) Explain the construction of the equipment and the method for Heat Distortion Temperature (HDT) testing of Plastic material. **07**
- Q.3** (a) Explain in detail Fourier Transform Infrared (FTIR) spectrometry with its importance in rubber technology. **07**
- (b) Describe Dynamic Mechanical Analysis (DMA) with its significance. **07**
- OR**
- Q.3** (a) Describe X-ray diffraction (XRD) spectrometry in detail. **07**
- (b) Explain the working of Differential Scanning Calorimetry (DSC) with graph for one polymer. **07**
- Q.4** (a) Explain Rotational viscometers and its working in brief with neat sketches. **07**
- (b) Write in detail the information, which can be found using Nuclear magnetic resonance (NMR) spectrometry of polymer. **07**
- OR**
- Q.4** (a) Explain in detail Powder Mix test of PVC resin using Torque Rheometer with its importance. **07**
- (b) As per ASTM D638, explain the Tensile Strength test in detail with the specimen dimensions and typical stress-strain curve. **07**
- Q.5** (a) Explain the Volume resistivity test method in detail with its application and factors affecting test results. **07**
- (b) Explain in detail Limiting Oxygen Index test with its significance. **07**
- OR**
- Q.5** (a) Explain Environmental Stress Crack Resistance (ESCR) test in detail with its importance. **07**
- (b) Explain the working of Scanning Electron Microscopy machine with its importance in polymer technology. **07**
