

GUJARAT TECHNOLOGICAL UNIVERSITY**B E Sem-VI Examination May 2011****Subject code: 162302****Subject Name: Plastic Structure, Property and Relationship****Date: 17/05/2011****Time: 10.30 am – 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.

- Q.1** (a) 1. PTFE is suitable for manufacture of gears. Explain 07
2. How does bond strength affect thermal stability in a polymer material? Explain with suitable examples.
- (b) Discuss Effect of hydrogen on polymer properties 07
- Q.2** (a) Discuss in detail, the effect of carbon on polymer properties 07
(b) Discuss in detail, the factors affecting crystallinity 07
- OR**
- (b) 1. High surface energy and high surface tension is seen in certain polymers due to presence of of which element? Explain 07
2. Discuss effect of amorphous structure on polymer properties
- Q.3** (a) Discuss how the structure of a polymer affects its mechanical properties 07
(b) How is the structure of a polymer related to its chemical properties? Discuss 07
- OR**
- Q.3** (a) Explain how the structure of nylons are related to their properties 07
(b) Discuss how presence of plasticizer affect properties of PVC 07
- Q.4** (a) Explain the relation of structure of a polymer and its electrical properties 07
(b) Discuss how molecular weight affects ultimate tensile strength and ultimate elongation in polymeric material 07
- OR**
- Q.4** (a) 1. Discuss relationship between molecular weight and Tg of polystyrene. 07
2. PE has a Tg of -20deg C. Why is it that it appears to be solid at room temperature?
- (b) 1. What makes PVC self extinguishing? 07
2. Discuss effect of C-O bond on polymer properties
- Q.5** (a) Discuss the relation between the structure and the properties of polyacetal resins. Mention the important properties and applications of polyacetals 07
(b) Explain the effect of nitrogen on polymer properties 07
- OR**
- Q.5** (a) Discuss the structure and properties of bis-phenol A polycarbonates. What are its important applications. 07
(b) 1. How does modulus of elasticity get affected with the average degree of polymerization? Explain with example 07
2. Explain effect of dielectric response of a polar polymer in an alternating electrical field
