

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016

Subject Code:2173607

Date:21/11/2016

Subject Name:Product Design Concept: Structures & Additives(Department Elective - VIII)

Time:10.30 AM to 1.00 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) Explain in detail the criteria for the selection of polymeric material for specific application. 07
- (b) Define tacticity. Explain in detail the effect of tacticity on the crystallinity of polymers with example. 07
- Q.2 (a) Write about the different parameters which affect glass transition temperature of polymers. 07
- (b) Explain in detail about the determination method for weight average molecular weight and viscosity average molecular weight of polymer. 07
- OR
- (b) Explain in detail about activator and accelerator and their functioning in rubber compounding. 07
- Q.3 (a) Explain the term: vulcanization. Write in detail about peroxide vulcanization of rubber with example. 07
- (b) Write a detail note on Thermogravimetric Analysis (TGA) and instrument used for polymers. 07
- OR
- Q.3 (a) Write in detail about cis and trans structures and their effect on their properties of polymers with example. 07
- (b) Write about the mechanism and working of UV stabilizers and light stabilizers to protect polymer from degradation. 07
- Q.4 (a) Suggest compounding recipe for truck tyre tread. Explain the role and reason for the selection of particular ingredient. 07
- (b) Explain in detail about shear strength test for polymer film used for food applications. 07
- OR
- Q.4 (a) Explain in detail the conventional mixing and upside down mixing process for rubber compounding. 07
- (b) Explain in detail about the oxygen permeability test for polymer film used for food applications. 07
- Q.5 (a) Write about the instrument and its parts used in gel permeation chromatography with diagram. Mention its working principle. 07
- (b) Explain the influence of injection moulding processing parameters on the properties of engineering plastics. Enlist two problems with possible causes. 07
- OR
- Q.5 (a) Explain in detail about scanning electron microscopy. Mention its importance in research and development activities related to polymers with suitable example. 07
- (b) Write short note on: 07
- (i) Transmission electron microscopy. (04)
- (ii) Identification of polymer by chemical methods (03)
