GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER III (NEW) – EXAMINATION – WINTER-2016

Subject Code: 2731603

Subject Name: Polymer Structure & Property Prediction

Date:25/10/2016

Total Marks: 70

Time:02:30 pm to 05:00 pm Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) "Nitrogen is an important element in organic chemistry." Justify the statement. 07
 - (b) How the monomeric ingredients impurities have a variety of effects upon the 07 properties & uses? Explain in detail.
- Q.2 (a) Explain the Molecular Stiffness Vs. Increasing Regularity of Molecular Structure 07 of Polymers.
 - (b) Establish the relationship between Thermal Motion, Free Volume & Segment 07 Mobility of Polymer molecule.

OR

- (b) Discuss the different additives in compounding to produce the final commercial 07 composition and properties.
- Q.3 (a) Write in detail about effect of Polymer molecular flexibility on Reversible 07 Mechanical Properties and Mechanical Failure.
 - (b) What do you mean by Mechanical Failure? How it may be observed in Polymeric 07 materials? Describe in detail.

OR

- Q.3 (a) Discuss the effect of Molecular flexibility on ultimate mechanical properties and 07 failure of Polymeric materials.
 - (b) Discuss the effects of molecular weight on Thermodynamic Properties.
- Q.4 (a) Short note on "Axes of Orientation".
 - (b) List the different structural factors which restrict the rotation of polymer 07 molecule. Explain these factors in detail.

OR

- Q.4 (a) Describe in detail about Cold Stretching, Warm Stretching & Wet Stretching 07 process for Orientation of Polymer Molecule.
 - (b) Discuss the important effect of Copolymerization & Plasticizer Structure on 07 molecular flexibility.
- Q.5 (a) Discuss the effect of Hydrogen Bonding upon melting and solubility behavior 07 during processing and upon mechanical strength & adhesion.
 - (b) Which forces are responsible for intermolecular attraction in Hydrocarbon 07 Polymers? Explain in detail.

OR

Q.5 (a) Discuss the different Stretching process for Polymer Orientation.
(b) Explain briefly about how the kinetic factors affect rate and extent of crystallization.
07

07

07