

B.Tech. Eighth Semester (Polymer (Plastics) Technology) (CGS)
11147 : Polymer Viscoelasticity & Rheology : 8 PP 02

P. Pages : 2

Time : Three Hours



AU - 3062

Max. Marks : 80

- Notes :
1. Answer three question from Section A and three question from Section B.
 2. Diagrams and chemical equations should be given wherever necessary.
 3. Illustrate your answer necessary with the help of neat sketches.
 4. Discuss the reaction, mechanism wherever necessary.

SECTION - A

1. a) What are different phase state of Matter? Discuss first order phase transition. 7
b) Differentiate between state of Aggregation and phase states of matter. 7

OR

2. a) Discuss in detail rubber like deformation in polymer. 7
b) Describe different types of transition relaxation processer in polymers? 7
3. a) Define and discuss the following terms with suitable examples. 6
i) Glass transition temperature.
ii) Crystallization.
b) What is the effect of molecular weight on T_g & T_f ? 7

OR

4. Explain in detail experimental techniques of determining the glass transition temperature? any two. 13
5. a) Explain Kelvin's model showing viscoelastic behaviour of polymers. 7
b) Describe creep of polymeric materials in detail. 6

OR

6. a) Define and explain the following terms : - 6
i) Shear modulus.
ii) Young's modulus
iii) Bulk modulus.
b) Discuss various types of viscosity and their relations. 7

SECTION – B

7. a) What do you mean by Rheology? Explain basic concept of Rheology by giving few examples. 7
- b) What are the different types of fluids? State the reasons why polymer melt and solutions show Non-Newtonian fluid behaviour. 7

OR

8. a) Explain the concept of Viscosity & its dependence on shear stress and shear rate. 8
- b) Explain the dependency of viscosity with temperature. 6
9. Discuss De-bye Bueche theory of viscosity for dilute solution in detail. 13

OR

10. a) What do you mean by Entanglement? Discuss the basic concept of Entanglement & its density? 7
- b) How will you measure the shear viscosity of polymer solutions experimentally by using cone and plate viscometer? 6
11. a) What are the assumptions given by Einstein Theory. 6
- b) Explain the effect of Rheological properties on blown film extrusion of polymers. 7

OR

12. a) Discuss the principle, working and significance of Bubble inflation rheometer. 6
- b) What is the effect of rheology during injection moulding of polymers? 7

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