

- (c) How can the concept of colligative properties be applied to calculate the molecular weight of polymers? What type of molecular weight can be calculated by using colligative properties? 5

[This question paper contains 4 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : 1501 I

Unique Paper Code : 2173540010

Name of the Paper : DSE: Polymer

Name of the Course : **B.Sc.(Prog.)**

Semester : V

Time : 2 Hours **Maximum Marks : 60**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
 - (b) **All** questions carry equal marks. There are **six** questions in **all**. Attempt any **four** questions.
 - (c) Use of scientific calculator is allowed.
- 1. (a) Write IUPAC name of polymer and structure of repeat unit of the following polymers :** 6
- (i) Teflon
 - (ii) Polystyrene
 - (iii) Polyvinyl chloride

- (b) How does polymer classified on the basis of modes of formation ? 4
- (c) Atmospheric oxygen is very good inhibitor. Explain. 4
2. (a) What do you understand by primary structure of polymer ? Explain. 6
- (b) Distinguish between homopolymer and copolymer. 5
- (c) What is emulsion polymerization ? 4
3. (a) Discuss Free volume theory. What is WLF equation ? 5
- (b) Enlist the factors affecting Crystallization Melting temperature of a polymer and explain it by giving reasons. 5
- (c) Why is range of Glass Transition Temperature observed ? Give reasons for higher strength of HDPE (High Density Polyethylene) as compared to Paraffin wax. 5
4. (a) What do you understand by 'Texture of polymer' ? Explain it. 5

- (b) What is degree of polymerization ? If M_n of polystyrene is 4,16,000, calculate the degree of polymerization. 5
- (c) Define Polydispersity Index. Give its significance. 5
5. (a) Atactic polypropylene is generally amorphous, soft and flexible while its isotactic form is crystalline, hard and tough. Explain. 5
- (b) What is a Ziegler-Natta catalyst ? Discuss its application in the polymer preparation. 5
- (c) Describe the light scattering method for the determination of molecular weight of a polymer. 5
6. (a) What are conducting polymers ? Write the applications of conducting polymers. 5
- (b) Discuss the kinetics of Anionic addition polymerization and derive the expression for kinetic chain length for this type of polymerization. 5