

Roll No.25.....

Exam Code : D-24

Subject Code—62426

B. Sc. EXAMINATION

(Main/Re-appear)

(Batch 2020 Onwards)

(Fifth Semester)

CHEMISTRY

CCL-504(i) Paper-II

Polymer Chemistry-II

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

1. Define/Explain the following : $8 \times 2 = 16$

- (a) What are homopolymers ? Give examples.
- (b) What is Ziegler-Natta Catalyst ? Give its use.

- (c) Give difference between glass transition temperature (T_g) and melting point (T_m).
- (d) Explain Crystallisability.
- (e) What is the effect of molecular weight on polymer properties ?
- (f) Define solubility parameter.
- (g) What are random co-polymers ?
- (h) Explain Polydispersity Index (PDI).

Unit I

- 2. (a) Discuss the kinetics and mechanism of anionic chain growth polymerization. 10
- (b) Write down the names of different polymerization techniques. Discuss suspension technique in detail. 6
- 3. (a) Explain the kinetics and mechanism of step-growth polymerization. 10
- (b) Differentiate between addition and condensation polymerization process. 6

Unit II

4. (a) What is Glass Transition Temperature (T_g) ? Give the factors affecting glass transition temperature. 10
- (b) Explain crystallisability and factors on which it depends. 4
- (c) Write a note on Crystallinity. 2
5. (a) Explain WLF equation. 10
- (b) Explain morphology of crystalline polymers. 6

Unit III

6. (a) What is the importance of molecular weight distribution curve in the characterization of a polymer sample ? 10
- (b) What is monodisperse and polydisperse system ? 4
- (c) Under what conditions number-average and mass-average molecular masses become equal ? 2

7. (a) Explain in detail the determination of molecular weight of a polymer by osmotic-pressure method. 10
- (b) How molecular weight of a polymer can be determined by End-group analysis ? 6

Unit IV

8. (a) Explain Flory-Huggins solution theory. 10
- (b) Give entropy, enthalpy and free energy change of mixing of polymer solution. 6
9. (a) What is dissolution of polymers ? Give effect of polymer properties on dissolution process. 8
- (b) Define a 'good' and a 'bad' solvent in terms of solubility parameters (δ). 4
- (c) Explain the typical phase diagram of binary polymer solution with UCST. 4