



QP CODE: 26019384



26019384

Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc POLYMER CHEMISTRY

**ELECTIVE - CH880401 - PROPERTIES AND CHARACTERIZATION METHODS OF
POLYMERS**

2019 Admission Onwards

53CD9B87

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Explain the term Crystallisability of a polymer structure and what are the factors affecting Crystallisability?
2. Write the Avrami relationship and explain the terms involved, taking into consideration a constant nucleation rate and constant linear growth.
3. Compare the solubility of crystalline and amorphous polymers.
4. Give a brief discussion on solvent gradient elution technique.
5. Give an account on ASTM standard testing methods of polymers.
6. Distinguish between piezo and pyro electric characteristics of polymers.
7. With help of suitable diagram, explain Voigt model of viscoelasticity.
8. Explain the principle of SEM analysis for polymer characterization.
9. Draw and label the different transitions obtained when a semicrystalline polymer is analysed by DSC.
10. Give an account on fluorescence labelling.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Explain briefly the various defects in crystalline polymers.





12. Explain the principle and basic components of a Transmission Electron Microscopy (TEM) and how does it help for analyzing a polymer sample morphology.
13. Give a brief discussion on multi component polymer-solvent systems.
14. Explain the mechanical properties of polymers. i) abrasion resistance, ii) tensile strength.
15. Give an account on conventional hardness testing methods of polymers.
16. Describe the light scattering method for the determination of molecular weight of polymers.
17. How does polymers classified according to recycling codes?
18. Explain essential features of biodegradation. Why are polymers generally difficult to biodegrade?

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

Weight 5 each.

19. Describe the different types strain induced morphologies normally seen during polymer crystallization.
20. Describe: i) micro conformations in polymer solutions, ii) conformational transitions in polymers
21. Describe the major factors which affect glass transition temperature of polymers; also give the relation between T_g and T_m .
22. Describe the application of vibrational, ESR and NMR spectroscopy for the identification of polymers.

(2×5=10 weightage)

