



QP CODE: 25024651



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, APRIL 2025
Fourth Semester
M Sc POLYMER CHEMISTRY
ELECTIVE - CH880401 - PROPERTIES AND CHARACTERIZATION METHODS OF
POLYMERS

2019 ADMISSION ONWARDS

F44AA06D

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Explain the nature of the Extended-Chain morphology of polymers crystallized from melt.
2. Write an expression for the energy barrier determination of secondary nucleation by applying the Hoffman's nucleation model.
3. Give an expression for the entropy of mixing of polymer solutions.
4. Give a brief discussion on ternary polymer-solvent systems.
5. What do you meant by flexural strength of polymers?
6. Give an account on the principle of hardness testing methods of polymers.
7. List out any four optical properties of polymers.
8. What do you meant by PDI of polymers, give its significance.
9. Explain the theory of Thermo gravimetry (TG) for polymer degradation analysis.
10. Differentiate between primary and secondary methods of plastic recycling.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Give a brief discussion on the structural and morphological features of Lamellae type polymer single crystals.
12. Discuss the Cold Drawing process of an un-oriented polymer fiber.
13. Discuss the conformational transitions in polymers.





14. Discuss the various electrical properties of polymers.
15. Briefly discuss the viscoelastic nature of polymers.
16. Write briefly the principles SEM and TEM analysis for polymer characterization.
17. Briefly discuss the application of Raman spectroscopy for the analysis polymer wastes.
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. Explain the principle and basic components of the following microscopy techniques for analyzing a polymer morphology (i) SEM (ii) TEM.
20. Explain briefly the various column elution techniques for polymer separation.
21. Describe the major factors which affect glass transition temperature of polymers; also give the relation between T_g and T_m .
22. Explain the theory and application of X-ray crystallography in determining the crystallinity of polymers.

(2×5=10 weightage)

