

2/21

0305N213

Candidate's Seat No : \_\_\_\_\_

MSc Sem.-2 Examination

409

Polymer Science

May-2025

Time : 2-30 Hours]

[Max. Marks : 70

**QUESTION – 1**

- (i) Explain in details the different methods for determining the molecular weight of polymers 7MARKS
- (ii). Explain light scattering technique and molecular weight distribution curve. 7 MARKS

OR

- (i) Describe the working principle and applications of gel permeation Chromatography. 7 MARKS

- (ii) explain the concept of colligative properties and how they help in polymer characterization 7MARKS

**QUESTION – 2** (i) Explain the principle, instrumentation, and applications of dynamic mechanical Thermal analysis ( DMTA)

7 MARKS

- (ii) Compare DTA,DSC,TGA with suitable examples

7 MARKS

OR

- (i) Give instrumentation, advantage and applications of TEM analysis. . 7 MARKS  
why TEM Is necessary in analysis

- (ii) Explain how DMA helpful in characterization of polymers

7 MARKS

**QUESTION – 3** (i) Describe the principles and applications of X-ray diffraction (XRD) in polymer Characterization. 7 MARKS

- (ii).Explain the role of AFM in polymer morphology

7 MARKS

OR

- (i) Give principal and instrumentation for UV and FTIR, how the technique helpful In polymer characterization. 7 MARKS
- (ii) Explain Lamber 's Law with principal. 7 MARKS

7 MARKS

(P.T.O)

- QUESTION – 4** (i) What are plastimeter and moony viscometer? Explain their role in Determining the cure characteristics of polymers. 7 MARKS
- (ii) Explain the different quality control testes used for rubber latex and Dry rubber. 7 MARKS
- OR
- (i) give methods for determination of KOH number. 7 MARKS
- (ii) how will you calculate dry rubber content and isocynides index?. 7 MARKS

- QUESTION – 5 Attempt any seven out of fourteen .** 14 MARKS
- (i) What is the chromatography? Give its classification.
  - (ii) Define Beer's law.
  - (iii) Explain scorch time.
  - (iv) Give principals and limitation of AFM?
  - (v) Differentiate between DSC & TGA.
  - (vi) Define end group analysis in polymers.
  - (vii) Give the suitable example of UV stabilizer.
  - (viii) What is dry rubber content
  - (ix) What is colligative property, and how is it used in polymer analysis?
  - (x) What is the significance of SEM in polymer characterization?
  - (xi) What is isocyanate index?
  - (xii) How does TEM differ from AFM
  - (xiii) Define NMR
  - (xiv) Why is thermal analysis important in polymer science?

**END**