



**Avinashilingam Institute for Home Science and Higher Education for Women  
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)  
Re-accredited with 'A++' Grade by NAAC. Recognised by UGC Under Section 12B  
Coimbatore - 641 043, Tamil Nadu, India**

**Continuous Internal Assessment Test – II, October 2025**

**Semester V**

**Class: III UG**

**Major: Chemistry**

**Time: 2 Hours**

**Max Marks: 60**

**23BCHDE4- Polymer Chemistry**

**Course Outcomes**

1. Identify and classify polymers
2. Comprehend the relationship between molecular weight and structure of polymers
3. Analyze properties of polymers
4. Know the process of polymerisation
5. Characterize polymers

**Part-A**

**Choose the correct Answer**

**6x1=6 marks**

1. The SI unit of linear coefficient of thermal expansion ( $\alpha$ ):  
a.  $\text{J mol}^{-1}\text{K}^{-1}$                       b.  $\text{K}^{-1}$   
c.  $\text{m}^2\text{s}^{-2}$                               d.  $\text{Pa}^{-2}$                                       **CO3K1**
2. The polymerisation technique that uses micelles to solubilise monomer is:  
a. Bulk                                      b. Solution  
c. Suspension                              d. Emulsion                                      **CO4K2**
3. In emulsion polymerisation, the initiator is:  
a. Oil soluble                              b. Water soluble  
c. Both water and oil soluble              d. Not required                                      **CO5K2**
4. Which of the following method is used to determine the molecular weight of polymers?  
a. Gel permeation chromatography (GPC)  
b. UV-Vis spectroscopy  
c. FTIR spectroscopy  
d. Differential Scanning Calorimetry                                      **CO5K1**
5. Which of the technique is most suitable for studying crystallinity of polymers?  
a. Scanning electron microscopy (SEM)              b. X-ray diffraction (XRD)  
c. Differential Scanning Calorimetry (DSC)              d. UV-Vis spectroscopy                                      **CO5K2**
6. Which technique is most suitable for thermal stability analysis of polymers?  
a. DSC                                      b. TGA  
c. NMR                                      d. FTIR                                      **CO5K2**

**Part B**

**3 x 6 = 18 marks**

**Answer the following**

**Answer should not exceed 200 words or one page**

7. a. Differentiate linear thermal expansion and volumetric thermal expansion. **CO3K1**  
(or)
7. b. Establish the pressure volume temperature relationship in the properties of polymer **CO3K2**
8. a. Write a note on stereochemistry of polymer. **CO4K2**  
(or)
8. b. How can we prepare stereospecific polymers. Give any two methods. **CO4K3**
9. a. Explain Ziegler-Natta Catalysis mechanism. **CO4K2**  
(or)
9. b. How determination of molecular weight of a polymer can be done at industrial level. **CO5K3**

**Part C**  
**Answer the following**  
**Answer should not exceed 200 words or one page**

**3 x 12= 36 marks**

10. a. Describe the industrial methods of polymer preparations, any two methods in detail.

**CO4K1**

**(or)**

10. b. Briefly explain the role of metallocenes in polymer synthesis

**CO4K2**

11. a. State any two techniques in the characterisation of polymers

**CO5K1**

**(or)**

11. b. Write a note on (i) Light scattering (ii) end group analysis (iii) viscosity. **CO5K1**

12. a. How NMR, FTIR, UV and mass spectral techniques are used in characterisation of polymers.

**CO5K3**

**(or)**

12. b. How catalysts help in preparing stereospecific polymers. Support your answer with suitable examples.

**CO5K3**

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**Staff in Charge: Dr. Neethu K S**

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