Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: **Polymer Chemistry** **Semester: II**

Program: **MSc Chemistry** **Time : 03 hrs.**

Course Code: CHEM 7052 **Max. Marks: 100**

Instructions: Answer all the questions. Internal choices are provided in Question No. 9 and Question No. 11.

SECTION A

S. No.		Marks	CO
Q1	Explain plasma polymerization with suitable diagram.	**4**	**CO1**
Q2	What are the differences between addition and condensation polymerization? Explain with examples.	**4**	**CO1**
Q3	Explain the role of micelles in emulsion polymerization. Discuss how micelles presence influences the properties of the resulting polymer.	**4**	**CO1**
Q4	Describe how the degree of crystallinity in polymers influences their mechanical strength and thermal behavior.	**4**	**CO1**
Q5	Discuss how polymer geometry and stereoregularity affect the physical properties of polymers, with reference to different tacticities.	**4**	**CO1**

SECTION B

Q6	Compare and contrast emulsion and suspension polymerization in terms of formulation, reaction mechanism, polymer properties, and applications.	**10**	**CO3**
Q7	Give details of the mechanism of free radical polymerization. Discuss the initiation, propagation, and termination steps with suitable examples and reaction schemes.	**10**	**CO2**
Q8	How the role of solvent and reaction conditions influence the kinetics of ionic polymerization?	**10**	**CO1**
Q9	What is group transfer polymerization (GTP)? Discuss the mechanism and significance of GTP in the synthesis of well-defined polymers.	**10**	**CO2**

	Or Compare thermoplastics, thermosetting polymers, and elastomers in terms of their molecular structures, thermal behavior, and typical applications. How do these differences influence their performance and usage?		
SECTION-C			
Q 10	(a) How do cationic and anionic polymerization mechanisms differ with respect to initiation, monomer suitability, and reaction mechanism? (b) Write notes on these: • Metathesis Polymerization • Ring opening Polymerization	**10 +10**	**CO2**
Q11	(a) Explain the effect of polymer crystallinity on mechanical and thermal properties of the polymers. ***Or*** Discuss the role of nano-catalysts in polymer synthesis with an emphasis on their contribution to sustainable practices. (b) What is melt polycondensation? Explain its mechanism with an example. How is it different from solution polycondensation? ***Or*** Write detailed notes on the following methods of polymerization: • Precipitation polymerization • Bulk polymerization • Interfacial polymerization	**10 + 10**	**CO3**