Name: **Enrolment No:**	

UPES

End Semester Examination, December 2023

Course: Introduction to Polymer chemistry **Semester: VII**

Program: B.Sc (Chem by Res) **Time : 03 hrs.**

Course Code: CHEM 4017P **Max. Marks: 100**

Instructions: All questions are compulsory.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Differentiate between (a) high polymers and oligopolymers (b) natural polymers and synthetic polymers	**4**	**CO1**
Q 2	Give two examples each of addition polymerization and condensation polymerization.	**4**	**CO1**
Q 3	What are the advantages and disadvantages of synthetic and natural fibres based materials.	**4**	**CO1**
Q 4	Write briefly about homopolymer and copolymer.	**4**	**CO3**
Q 5	Describe the formation of bakelite from its monomers.	**4**	**CO1**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Equal number of molecules with M_1 = 10,000 and M_2 = 1,00,000 are mixed. Calculate the number-average and mass-average molecular mass of the polymer. Also, calculate the polydispersity of the polymer sample.	**10**	**CO1**
Q 7	Click chemistry is useful for the percentage detection of click based self-healing coatings. Explain with example.	**10**	**CO2**
Q 8	Describe the factors affecting glass transition temperature of the polymers.	**10**	**CO3**
Q 9	Explain the effect of polymer crystallinity on mechanical and thermal properties of the polymers. ***Or*** Discuss briefly the kinetics of (i) addition polymerization and (ii) condensation polymerization.	**10**	**CO2**

SECTION-C (2Qx20M=40 Marks)			
Q 10	(i) Differentiate between polymer blends and composites. Also briefly cover their application in daily life. (ii) What do you mean by Engineering plastics? How the following Engineering plastics can be synthesized? (a) Polycarbonates (b) Nylon 6,6 (c) Teflon ***Or*** What are electronically conducting polymers? Discuss the electrical conductivity of (i) poly (sulphur nitride) and polyacetylene.	**10 + 10**	**CO3**
Q 11	(i) Explain the mechanism of ring-opening polymerization with an example. ***Or*** What do you mean by synthetic metal? Explain with examples. (ii) Describe crystal morophologies in terms of extended chain crystals, chain folding, lamellae, and spherulites.	**10 + 10**	**CO2**