UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Programme Name: B.Tech. Chemical Engineering (Refining & Petrochemicals) **Semester : VII**
Course Name : Polymer Science & Engineering **Duration : 03 hrs**
Course Code : CHCE 3011P **Max. Marks: 100**

SECTION-A (5 x 4 = 20 Marks)
Attempt all questions

Sl. No.	Answer in one or two lines (short answer type)	Marks	CO
Q1	Explain advantages and disadvantages of thermoplastics.	4	**CO1**
Q2	Explain the difference of cross linked polymers from network polymer?	4	**CO1**
Q3	Illustrate the formation of isotactic polymers in Ziegler-Natta polymerization?	4	**CO3**
Q4	Describe two major differences between solution and suspension polymerization?	4	**CO4**
Q5	Define the acidolysis reaction? Give an example.	4	**CO5**

SECTION-B (4 x 10 = 40 Marks)
Attempt all questions (any one of Q7)

Answer in few lines (medium duration type)

Q6	An equal number of protein mixture containing: 15.5 Kg/mol Haemoglobin; 13.7 Kg/mol of Ribonuclease and 17.2 Kg/mol of Myoglobin (a) Calculate number-average, mass-average and z-average molecular weight of the protein solution. (b) Calculate polydispersity index (PDI)? Is it monodisperse or polydisperse polymer?	10	**CO2**
Q7	(a) Explain hydrolytic degradation and photo-degradation with example. OR (b) Explain hydrogenation and crosslinking reaction with example.	10	**CO5**
Q8	Briefly describe the different chain transfer process for termination of cationic polymerization.	10	**CO3**
Q9	Explain suspension polymerization techniques including advantages and disadvantages.	10	**CO3**

SECTION-C (20 x 2 = 40 Marks)
Attempt all questions

Answer comprehensively (long answer type)

Q10	Explain how different types of copolymerization are classified based on the monomer reactivity ratios.	20	**CO4**
Q11	Explain Un-catalyzed polymerization and compare with Catalyzed polymerization.	20	**CO3**