Motilal Nehru National Institute of Technology Allahabad
Prayagraj 211004 (India)

Mid Semester Examination 2024-25

Programme Name: B.Tech./ ~~M.Tech./ MBA/ M.S./ MCA~~ **Semester:** 6th

Course Code: CHN-16264 **Course Name:** *Polymer Science & Technology*

Branch: Chemical **Student Reg. No.:** 2 0 2 2 2 0 6 8

Duration: *1.5 Hours* **Max. Marks:** 25

Instructions: *Marks and the number of questions to be attempted from the section are mentioned before each section. Assumed data if required.*

Attempt all the questions.

Sl. No	Question	Marks
1.	(a) Define molecular weight of polymer with example. (b) Define Homochain & Heterochain Polymers.	1 1
2.	What is the polymerization process? Write down the classification of polymerization process.	3
3.	What is average molecular weight? Explain the concept of number and weight average molecular weight giving an example to justify their concept.	5
4.	What is measured using DSC? Write down various applications of DSC. What are various properties of the polymers that can be inferred using DSC?	3
5.	Differentiate between step growth and chain growth polymerization mechanism.	4
6.	What is coordination polymerization? Explain about the catalyst used for coordination polymerization.	3
7.	Name the reactions involved in step growth polymerization. Explain the kinetics for Self-catalyzed reactions with graph $-r = kc^3$	5

---------- *Best of Luck* ----------

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END [redacted] Semester Examination 2024-25

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Course Code: CHN-16264 **Course Name:** *Polymer Science & Technology*

Branch: Chemical **Student Reg. No.:** 2 0 2 2 2 0 6 8

Duration: *2.5 Hours* **Max. Marks: 50**

Instructions: *Marks and the number of questions to be attempted from the section are mentioned before each section. Assumed data if required.*

Attempt all the questions

Sl. No	Question	Marks
1.	I. What is the polymerization process? Write down the classification of polymerization process. II. What are the various techniques used for the analysis of polymeric materials? III. Define molecular weight of polymer with example A sample of polymer contains 40% molecules with molecular mass 10,000, 40% with molecular mass 50,000 and 20% with molecular mass 70,000. What is the number average molecular mass of the polymer?	2 2 6 40000 20000
2.	a. Explain stress vs. strain curve. b. Define the following terms: I. Percent Elongation II. Toughness III. Strength c. Differentiate between melting point and glass transition temperature. d. Explain Linear, Branched and crosslinked polymers by giving suitable example for each type.	1 3 3 3
3.	a) Name the reactions involved in step growth polymerization. Explain the kinetics for Acid-catalyzed reactions with graph. b) Define copolymerization. Derive the copolymerization by writing the suitable assumptions	6 4
4.	a) Write the preparation of Polyurethane with its structure, properties, and applications. b) Differentiate between blend, Composite, and nanocomposite. c) Write down the application of nylon in plastics. d) What is PVA? Write its reaction mechanism. poly vinyl acetate	4 3 1 2
5.	a) Differentiate between elastomer, plastics, and rubber. b) What are the various processing techniques for polymerization? Explain injection moulding in detail. c) What is thermoforming and is used for which type of material? Explain the process in detail	3 4 3

---------- *Best of Luck* ----------