BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: BTech **SEMESTER :**
BRANCH: Chemical Engineering **SESSION : SP/2024**

SUBJECT: CL229 MACROMOLECULAR SCIENCE

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Classify polymers based on their sources, and thermal behavior. Give one examples of each of the classes	[2]	CO213.1	4
Q.1(b)	What principle is used in the determination of MW by vapor pressure osmometry?	[3]	CO213.2	1
Q.2(a)	How the thermal properties of polymers are dependent on their chemical structure? Explain with suitable example.	[2]	CO213.1	1
Q.2(b)	If 100gm of a polymer of MW 1000gm/mole is mixed with 500gm polymer of same kind having MW 1000000gm/mole, evaluate its Polydispersity Index?	[3]	CO213.4	4
Q.3(a)	Define tacticity. Differentiate polymers based on their tacticity with proper diagram.	[2]	CO213.1	1
Q.3(b)	List the applications of Carothers equation. Develop this equation for adipic acid / hexamethylene tetraamine system.	[3]	CO213.2	3
Q.4(a)	What are the characteristic features of condensation polymerization?	[2]	CO213.2	1
Q.4(b)	In the polymerization of hexamethylene diamine and adipic acid, a 2 % excess of adipic acid is present. Calculate degree of polymerization of the polymer formed for 98 % conversion.	[3]	CO213.4	4
Q.5(a)	Explain the technology and advantages of interfacial polymerization.	[2]	CO213.1	5
Q.5(b)	Construct the kinetic expressions for self-catalyzed condensation polymerization.	[3]	CO213.3	3

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