National Institute of Technology Hamirpur
Department of Chemical Engineering

B.Tech. 4rd Year (Semester VIII)
Polymer Science and Engineering (CH 460)
End Semester Examination

Max Marks: 50   **Time: 3 Hrs**   **Date: 08/05/2023**

1(a)	Very briefly explain five molding techniques for plastics.	5
1(b)	What is origin of rubber elasticity? Briefly explain about rubber compounding.	5
2(a)	Explain flow sheet for low pressure process for manufacture of polyethylene.	5
2(b)	Explain five applications of photo polymerization.	5
3(a)	What properties of Rayon makes it a unique fibre? Mention the reaction steps involved in its manufacture.	6
3(b)	What is solution polymerization? Write it's advantages and disadvantages.	5
4(a)	Briefly discuss classification of polymers based on functionality and physical structures.	6
4(b)	Explain Ziegler Natta polymerization process for growth of chain.	3
5(a)	If a 5% solution of a monomer A containing 10^{-4} mol/L of peroxide P is polymerized at 70^0C, 40% of the original monomer charge is converted to polymer in 1 h. How long will it take to polymerize 90% of the original monomer charge in a solution containing (initially) 10% A and 10^{-2} mol/L of peroxide P? (Simplification that can be used: $1-\exp(-k_d t) = k_d t$)	6
5(b)	A sample of poly(vinyl chloride) is composed according to the following fractional distribution:	4

Weight fraction(w_i)	0.04	0.23	0.31	0.25	0.13	0.04
Mean mol. wt., ($Mi*10^{-3}$)	7	11	16	23	31	39

Calculate $\overline{M_z}$

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