Name:

Enrolment No:

UPES

End Semester Examination, December 2023

Course: Polymer Chemistry **Semester: III**

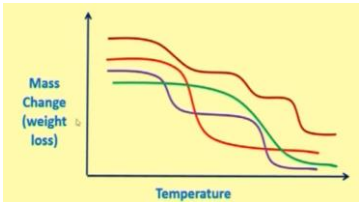
Program: M.Sc **Time : 03 hrs.**

Course Code: CHEM8013P **Max. Marks: 100**

Instructions:

1. **Write your enrolment number on the top left of the question paper**
2. **Do not write any thing else on the question paper except your enrolment number**
3. **Attempt all part of a question at one place only**
4. **Internal choice is given for question number 9of Section B and question number 11 of Section C only**

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Discuss Hydrolysis reaction in case of Polymers	**4**	**CO3**
Q2	Enumerate the relationship between Tg and Tm.	**4**	**CO4**
Q3	Give the relationship between molecular weight and degree of polymerization.	**4**	**CO4**
Q4	What information do you get from the given TGA curve:  From top name the curves as 1,2,3,4 while explaining.	**4**	**CO4**
Q5	Vinyl chloride monomer on polymerization form PVC with a molecular weight of 17500 gm, calculate the degree of polymerization.	**4**	**CO1**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Compare transfer molding with compression molding technique.	**10**	**CO2**
Q7	Calculate the number average, weight average molecular weight and PDI for the Polystyrene (PS) mixture having following composition:	**10**	**CO1**

	PS molecules with DP 100 is 30% PS molecules with DP 200 is 40% PS molecules with DP 400 is 60 %		
Q8	Explain the various steps involved in conversion of raw polymer into cold drink bottle.	**10**	**CO2**
Q9	a) What are Co-polymers? In some applications, why it is preferred over Homopolymers. Give suitable examples to support your answer. With the help of diagram, explain types of copolymers. **OR** b) Give reasons: i) Plasticizers are added to polyvinylchloride. ii) Polyvinylchloride is more polar than polyethylene. iii) Polyvinylchloride is further chlorinated. iv) Polystyrene mainly occurs in atactic form. v) The molecular weight of polymers is expressed as average. vi) PMMA is used for making sign boards. c) Giving example, explain polycondensation reaction in case of polymers.	**10** **6** **4**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
Q10	With the help of diagram, explain, different zones and their function in an injection molding machine.	**20**	**CO2**
Q11	a) Taking example, determine the formulae to calculate the number average and weight average molecular weight. b) Discuss in detail any two methods to determine glass transition temperature. **OR** a) Explain Cryoscopy, a method to determine molecular weight of a polymer. b) Along with pictorial representation, explain, the change of state with temperature in polymeric material.	**10** **10** **10** **10**	**CO4**