Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160511 Date:02/12/2021

Subject Name:Polymer Science and Technology

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define: (i)Monomer (ii)Polymerization (iii)Number average molecular weight.	**03**
	(b)	Explain effect of molecular weight on polymer.	**04**
	(c)	What is polymer? Classify polymer on basis of its structure.	**07**
Q.2	**(a)**	Define: (i)Weight average molecular weight (ii)Viscosity average molecular weight (iii)Z average molecular weight.	**03**
	(b)	What is degree of polymerization and functionality?	**04**
	(c)	State Mark-Houwink Sakurda equation with its significance.	**07**
		OR	
	(c)	Classify the polymers with respect to their origin. Give examples of each with structure?	**07**
Q.3	**(a)**	Explain block and graft polymers.	**03**
	(b)	Write a short note on Co-Polymerization.	**04**
	(c)	Which Unit operations find applications in polymer industries?	**07**
		OR	
Q.3	**(a)**	Explain different types of monomer.	**03**
	(b)	Explain the concepts of tacticity and crystallinity in polymer.	**04**
	(c)	Discuss the mechanism for addition polymerization.	**07**
Q.4	**(a)**	Explain Stereo Polymerization in brief.	**03**
	(b)	Explain chain and random degradation of polymers with examples?	**04**
	(c)	List different techniques of polymerization and explain any one in detail.	**07**
		OR	
Q.4	**(a)**	Explain bio degradation in polymer.	**03**
	(b)	Compare the merits and demerits of different polymerization techniques?	**04**
	(c)	Explain the emulsion and suspension polymerization techniques.	**07**
Q.5	**(a)**	Explain Poly condensation polymerization.	**03**
	(b)	Discuss different methods for rubber processing.	**04**
	(c)	Describe thermal degradation and mention the factors affecting the thermal stability of polymers?	**07**
		OR	
Q.5	**(a)**	Explain processing of polymer by extrusion in brief.	**03**
	(b)	Explain Injection molding and Blow molding.	**04**
	(c)	Discuss applications of polymers in chemical industries.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160511 Date:08/06/2022

Subject Name:Polymer Science and Technology

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain monomer and it's functionality.	**03**
	(b)	Describe conformation and configuration of polymer.	**04**
	(c)	Discuss classification of polymer in detail.	**07**
Q.2	**(a)**	Explain polymer dispersity and molecular weight distribution.	**03**
	(b)	Explain the Concept of Number average molecular weight, weight average molecular weight, viscosity average molecular weight and Z average molecular weight.	**04**
	(c)	Explain effect of molecular weight on polymer and their measurement techniques.	**07**
		OR	
	(c)	Discuss the theory of polymer solutions, solubility parameter and Mark-HouwinkSakurda equation.	**07**
Q.3	**(a)**	Explain addition polymerization.	**03**
	(b)	Describe rearrangements and stereo Polymerization.	**04**
	(c)	Discuss polymerization reactions in details.	**07**
		OR	
Q.3	**(a)**	Explain emulsion and suspension polymerization techniques.	**03**
	(b)	Compare bulk, solution, and emulsion and suspension polymerization.	**04**
	(c)	Discuss different polymerization techniques.	**07**
Q.4	**(a)**	Explain polymer degradation.	**03**
	(b)	Differentiate Chain and random polymerization.	**04**
	(c)	Explain the methods of degradation of polymers such as mechanical, thermal, photo, oxidative and bio degradation.	**07**
		OR	
Q.4	**(a)**	What is Bio degradation? Explain with example.	**03**
	(b)	Discuss emulsion and solution polymerization with examples.	**04**
	(c)	Explain polymerization techniques with any two case studies.	**07**
Q.5	**(a)**	What unit operations are being used in polymer Industries?	**03**
	(b)	Explain different molding techniques.	**04**
	(c)	Discuss any polymer processing unit with examples.	**07**
		OR	
Q.5	**(a)**	Explain thermoforming and rubber processing in two-roll mill.	**03**
	(b)	Explain application of injection and transfer molding.	**04**
	(c)	Explain Co-ordination polymerization and condensation Polymerization	**07**

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