

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

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**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**

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

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