

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 3132301****Date: 28/11/2019****Subject Name: Plastics Material Science****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		Marks
<b>Q.1</b>	(a) Draw the structures of i)PMMA ii) PVC iii)PS	<b>03</b>
	(b) Explain thermoplastics & thermosets giving examples.	<b>04</b>
	(c) Differentiate between polymers & low molecular weight compounds.	<b>07</b>
<b>Q.2</b>	(a) What are natural polymers? Give examples.	<b>03</b>
	(b) Define i) Monomer ii) Polymer iii) Inhibitor iv) Glass Transition Temperature	<b>04</b>
	(c) Differentiate between chain and step polymerization.	<b>07</b>
<b>OR</b>		
	(c) Write a short note on initiators used in free radical polymerization.	<b>07</b>
<b>Q.3</b>	(a) What is the molecular weight of PP if the no. of repeating units is 1500.	<b>03</b>
	(b) Explain the bulk polymerization technique.	<b>04</b>
	(c) Which are the types of Addition Polymerisation? Explain free radical polymerization in detail.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Discuss about practical significance of polymer molecular weight.	<b>03</b>
	(b) Explain about homopolymers and copolymers giving examples.	<b>04</b>
	(c) What is isomerism? Explain about stereoregular polymers.	<b>07</b>
<b>Q.4</b>	(a) Write a short note on hydrolysis & aminolysis reactions.	<b>03</b>
	(b) Explain the suspension polymerization technique.	<b>04</b>
	(c) Give the detailed classification of polymers.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) State the functional groups and functionality of i) C <sub>6</sub> H <sub>5</sub> COOH ii) OHCH <sub>2</sub> CH <sub>2</sub> OH iii) NH <sub>2</sub> (CH <sub>2</sub> ) <sub>6</sub> NH <sub>2</sub>	<b>03</b>
	(b) Explain condensation polymerization with examples.	<b>04</b>
	(c) What is polydispersity? Explain polydispersity and molecular weight distribution in polymers.	<b>07</b>
<b>Q.5</b>	(a) Calculate Mn(Number Average molecular weight) of a polymer consisting of three fractions with molecular weights, 1x10 <sup>5</sup> , 2x10 <sup>5</sup> & 3x10 <sup>5</sup> . The mole fractions are found to be 0.1, 0.5 & 0.4 respectively.	<b>03</b>
	(b) Briefly explain about Plastics, Elastomers, Fibers & Liquids.	<b>04</b>
	(c) Explain the factors affecting Tg of a polymer.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Explain chain termination by chain transfer reaction.	<b>03</b>
	(b) Differentiate between crystalline & amorphous polymers.	<b>04</b>
	(c) Explain the factors affecting crystallinity of a polymer.	<b>07</b>

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