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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
Q.1	(a) Draw the structures of i)PMMA ii) PVC iii)PS	03
	(b) Explain thermoplastics & thermosets giving examples.	04
	(c) Differentiate between polymers & low molecular weight compounds.	07
Q.2	(a) What are natural polymers? Give examples.	03
	(b) Define i) Monomer ii) Polymer iii) Inhibitor iv) Glass Transition Temperature	04
	(c) Differentiate between chain and step polymerization.	07
OR		
	(c) Write a short note on initiators used in free radical polymerization.	07
Q.3	(a) What is the molecular weight of PP if the no. of repeating units is 1500.	03
	(b) Explain the bulk polymerization technique.	04
	(c) Which are the types of Addition Polymerisation? Explain free radical polymerization in detail.	07
OR		
Q.3	(a) Discuss about practical significance of polymer molecular weight.	03
	(b) Explain about homopolymers and copolymers giving examples.	04
	(c) What is isomerism? Explain about stereoregular polymers.	07
Q.4	(a) Write a short note on hydrolysis & aminolysis reactions.	03
	(b) Explain the suspension polymerization technique.	04
	(c) Give the detailed classification of polymers.	07
OR		
Q.4	(a) State the functional groups and functionality of i) C_6H_5COOH ii) $OHCH_2CH_2OH$ iii) $NH_2(CH_2)_6NH_2$	03
	(b) Explain condensation polymerization with examples.	04
	(c) What is polydispersity? Explain polydispersity and molecular weight distribution in polymers.	07
Q.5	(a) Calculate M_n (Number Average molecular weight) of a polymer consisting of three fractions with molecular weights, 1×10^5 , 2×10^5 & 3×10^5 . The mole fractions are found to be 0.1, 0.5 & 0.4 respectively.	03
	(b) Briefly explain about Plastics, Elastomers, Fibers & Liquids.	04
	(c) Explain the factors affecting Tg of a polymer.	07
OR		
Q.5	(a) Explain chain termination by chain transfer reaction.	03
	(b) Differentiate between crystalline & amorphous polymers.	04
	(c) Explain the factors affecting crystallinity of a polymer.	07
