

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- V (New) EXAMINATION – WINTER 2019

Subject Code: 2152306
Date: 21/11/2019
Subject Name: Chemistry of Plastic Materials
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.

		MARKS
Q.1	(a) Give one example of alternating and block copolymers with structure.	03
	(b) Define and Explain Homopolymer and co-polymer.	04
	(c) Give classification of Polymer in detail with example.	07
Q.2	(a) What is difference between Buna-N and Buna-S rubber?	03
	(b) The Mn of Polypropylene is 106gm/mol. Find the DPn.	04
	(c) Discuss Carothers' Equation in detail.	07
	OR	
	(c) Explain the mechanism of Anionic addition polymerization in detail.	07
Q.3	(a) List the generalized steps for polymerization.	03
	(b) Give chemical structure of the following polymer: (1) PP (2) PVC (3) PET	04
	(c) Explain various types of bonding exist in polymers with example.	07
	OR	
Q.3	(a) Write chemistry of formation of Melamine Formaldehyde (MF)	03
	(b) Explain the manufacturing process of MF with flow diagram.	04
	(c) Explain in brief about Tapping (Extraction) of Latex.	07
Q.4	(a) What is natural rubber? Give the structure of polyisoprene.	03
	(b) What is compounding. Explain vulcanization of rubber in detail.	04
	(c) Write structure, properties, and application of chlorinated rubber.	07
	OR	
Q.4	(a) Calculate the number average degree of polymerisation of an equimolecular mixture of hexamethylenediamine and adipic acid for the extents of reaction 0.5 and 0.8.	03
	(b) In the polymerisation of ω -hydroxy caproic acid, $\text{HO}(\text{CH}_2)_5\text{COOH}$, a 2% impurity present. Calculate the degree of polymerisation of polymer formed.	04
	(c) Derive the following equation for free radical polymerization $R_p = K_p (K_d^{1/2}/K_t^{1/2}) \{f [I]^{1/2} [M]\}$	07
Q.5	(a) Short note on: Natural Polymer Starch and Lignin.	03
	(b) Give chemical structure of PTFE. Discuss the properties of PTFE.	04
	(c) Discuss chemistry, properties and application of HDPE.	07
	OR	
Q.5	(a) Derive the equation between number average degree of polymerisation (P) and Kinetic chain length (γ).	03
	(b) Differentiate: Crystalline Polymer and Amorphous Polymer.	04
	(c) Short note on: Tacticity of Polypropylene.	07
