

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3173626****Date:01-12-2023****Subject Name: Polymer Material, Properties and Structure****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: (a) Osmometry (b) Crystallinity (c) Cryoscopy	03
	(b) What do you mean by chain flexibility? Mention the factors influencing chain flexibility of polymers.	04
	(c) Give detailed information about cryoscopy method.	07
Q.2	(a) Write a short note on spherulite structure of polymer.	03
	(b) Explain in detail about heat distortion temperature of polymers.	04
	(c) Write short note on glass transition temperature and melting point of polymers.	07
OR		
Q.3	(c) Explain in detail about Vapour pressure Osmometry.	07
	(a) Explain polymer molecular mass heterogeneity and structure properties.	03
	(b) Write in detail about gel permeation chromatography.	04
	(c) What do you mean by polymer degradation? Explain different types of polymer degradation.	07
OR		
Q.3	(a) Give the detailed classification on biopolymers.	03
	(b) What are the factors effecting dissolution and swelling of polymers?	04
	(c) List out the different physical properties of polymers? Explain about any one in detail.	07
Q.4	(a) Explain the concept of polymer swelling.	03
	(b) Write down brief note on phase equilibrium of polymer-solvent systems.	04
	(c) Write in brief about gradient elution technique.	07
OR		
Q.4	(a) Write short note on atomic force microscopy (AFM).	03
	(b) Write a short note on viscosity of polymers and rubbers.	04
	(c) Explain in detail about Florry-Huggins theory,	07
Q.5	(a) What are the Testing methods available for flexible films used in food applications?	03
	(b) List out various biopolymers and explain in brief about any one of them.	04
	(c) Write a short note on transmission electron microscopy (TEM).	07
OR		
Q.5	(a) Write in brief about adhesion test of polymeric films.	03
	(b) How to identify polymers using chemical methods?	04
	(c) What do you mean by Microscopy? Explain in detail about SEM with relevant figure.	07
