

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2173607

Date: 26/11/2019

Subject Name: Product Design Concept: Structures & Additives

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) Define PDI with its Significance.	03
	(b) Give the classification of molecular weight determination techniques.	04
	(c) Explain various effects of processing parameters on the structure of polymeric material.	07
Q.2	(a) Which technique is available for Tg measurement? Explain in detail.	03
	(b) Give the structural features of polymeric materials.	04
	(c) What is the Tg of PET? Explain effect of Tg on the properties of polymer.	07
OR		
	(c) What do you mean by chain Flexibility? Explain its effect on structure of polymers.	07
Q.3	(a) Define functionality and Functionality group equivalent.	03
	(b) What do you mean by Spherulite structure? Explain with diagram.	04
	(c) Explain viscometry method with the help of mark-Houwink equation.	07
OR		
Q.3	(a) How additives will affect the structure and properties of polymers?	03
	(b) Describe the effect of molecular weight on properties of polyolefin.	04
	(c) Suggest any additives which will enhance the plasticity of material and explain its properties as well as applications.	07
Q.4	(a) What do you mean by crystallisability? What are the factors that effect on it?	03
	(b) Explain End Group Analysis method for molecular weight determination.	04
	(c) Give the list of different techniques used for number average molecular weight determination and explain in detail about GPC.	07
OR		
Q.4	(a) Enlist different chemical methods used for polymer identification.	03
	(b) Explain polymer degradation along with its types.	04
	(c) Write a short note on cryoscopy method.	07
Q.5	(a) Explain basic principle of Ebullioscopy.	03
	(b) Explain Gradient Elution technique.	04
	(c) What do you mean by SEM? Explain its details with the help of neat diagram.	07
OR		
Q.5	(a) Write down the principle behind ultracentrifugation technique.	03
	(b) List out various techniques available for flexible film for food applications. Explain adhesion peel test in detail.	04
	(c) Write down the details of vapour pressure osmometry.	07
