Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(New) • EXAMINATION – WINTER 2016

Subject Code:2153602 Date:22/11/2016

Subject Name:Polymer & Rubber materials - I(Department Elective- III)

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		**Short Questions**	**14**
	1	What is PEEK?	
	2	What are the two key properties of Polyoxymethylene?	
	3	What is PBT?	
	4	Give structure of PET.	
	5	Write structure of Nylon 6 & Nylon 6,6.	
	6	Write the chemical structure of PMMA.	
	7	What is polyisobutylene chemically?	
	8	Write two key applications of EVA.	
	9	Difference between GPPS and HIPS?	
	10	Major limitation of PVDC.	
	11	What is ABS.	
	12	What are PC?	
	13	What are thermoplastic polymers?	
	14	Give two applications of LLDPE.	
Q.2	**(a)**	How polypropylene is prepared, support your answer with chemistry involved in it.	**03**
	(b)	What are polysulphones? Give their synthesis methods.	**04**
	(c)	Elaborate production of LDPE plastic material with the help of flow sheet.	**07**
		OR	
	(c)	Compare and contrast the various properties of polyethylene and polyamides.	**07**
Q.3	**(a)**	Arrange the following in descending order of Tg: PS, PE, PBT, PEEK, PC, Nylon-6	**03**
	(b)	Write a note on PEEK.	**04**
	(c)	Explain phosgination route for Polycarbonate synthesis and also write various applications of Polycarbonate.	**07**
		OR	
Q.3	**(a)**	Arrange the following in ascending order of T_g: PMMA, PS, PE, PET, PVC, PP	**03**
	(b)	What is the difference between liquid crystal polymers and conventional crystalline polymers in the melt at rest and during shear? Support your answer with the help of neat sketch.	**04**
	(c)	Suggest polymer for under water safe guard for aquarium. Elaborate in detail the production of suggested plastic material with the help of flow sheets.	**07**
Q.4	**(a)**	How PET is synthesized? Write the chemical reactions involved.	**03**
	(b)	Write a note on 'Sioplas Silane method for PE cross linking'.	**04**
	(c)	Name plastic involved in oxygen barrier film. Write in detail about synthesis, and applications of suggested polymer.	**07**
		OR	
Q.4	**(a)**	Write various properties of PTT.	**03**

	(b)	Write a note on ‘Azo method for PE cross linking’.	**04**
	(c)	Explain in detail production of nylon 6,6 plastic material with flow sheet.	**07**
Q.5	**(a)**	Give synthesis of PAN polymer.	**03**
	(b)	Explain the preparation and properties of polyacrylic acid.	**04**
	(c)	Write the synthesis, properties and applications of SAN polymer.	**07**

OR

Q.5	**(a)**	Suggest polymer for housing of washing machine and give its synthesis too.	**03**
	(b)	Write in brief about the major properties and applications of SMA copolymer.	**04**
	(c)	How Polystyrene plastic can be synthesized, explain with the help of flow sheet.	**07**

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