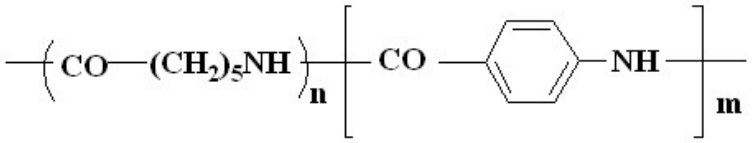
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER: VI**
BRANCH: CHEMISTRY **SESSION: SP/2023**

SUBJECT: CH317 POLYMER CHEMISTRY

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.

			CO	BL
Q.1(a)	Compare thermoplastic and thermoset plastic. Classify the polymers on the basis of intermolecular forces.	[5]	1	1
Q.1(b)	Derive the relation between functionality, extent of reaction and degree of polymerization.	[5]	1	3
Q.2(a)	Describe by means of equation how following block copolymer can be synthesized from its monomers: 	[5]	2	3
Q.2(b)	Explain the formation of alternate copolymer from the terminal model of copolymerization.	[5]	2	1
Q.3(a)	Calculate the relative viscosity, specific viscosity and reduced viscosity of a 0.5 % polymer solution where the time for solvent flow between the marks was 60 s and that of the polymer solution was 80 s. Compute the molecular weight of the polymer having intrinsic viscosity of 150 cc/g (Given a = 0.6 and K = 1.6104 dL/g)	[5]	3	2
Q.3(b)	What is the significance of glass transition temperature and melting temperature of a polymer? Explain the order of glass transition temperature of polyethylene, polyvinyl alcohol and Nylon 66.	[5]	3	3
Q.4(a)	Describe the thermodynamical aspects of polymer solubilization phenomenon.	[5]	4	1
Q.4(b)	Differentiate between van Laar model of solubility of low molecular-weight solute with the Flory-Huggins model of polymer solubility.	[5]	4	2
Q.5(a)	Briefly discuss the difference in branching for LLDPE and LDPE. Compare the difference in their properties.	[5]	5	2
Q.5(b)	Describe the difference of Bakelite and Novolac. How does the polymers prepare in industry? Explain the mechanism for their formation.	[5]	5	3

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