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

CLASS: BE **SEMESTER: V**
BRANCH: CHEMICAL ENGG.- PLASTICS & POLYMER **SESSION : MO/2018**

SUBJECT : PC5003 MACROMOLECULAR SCIENCE - II

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What is average functionality? Give example. [2]
(b) Derive Carother's equation. [3]

Q2 (a) Write down the basic characteristic features of condensation polymerization. [2]
(b) Derive the kinetic rate expression of acid-catalysed polyesterification reaction. Discuss the nature of graph for this reaction with proper explanation. [3]

Q3 (a) Differentiate between condensation and addition polymerization. [2]
(b) MMA may be polymerized if kept outside refrigerator – Explain what happens in this case and write down the reactions that lead to polymerization. [3]

Q4 (a) What is kinetic parameter? How can you determine its value experimentally? [2]
(b) Define kinetic chain length. Derive its expression for thermal polymerization reaction. [3]

Q5 (a) Distinguish between inhibition and retardation reaction. [2]
(b) Derive the expression of degree of polymerization in cationic polymerization when termination occurs exclusively by monomer transfer. [3]

Q6 (a) Write down the reaction mechanism of polymerization of styrene In presence of sodium naphthalene in THF solvent. [2]
(b) Discuss the monometallic mechanism of PP polymerization using Z-N catalyst. [3]

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