

[This question paper contains 3 printed pages.]

3142

Your Roll No.

M.E.

J

POLYMER TECHNOLOGY

Paper – CH.502

(Polymerization)

Time : 3 Hours

Maximum Marks : 100

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt any five questions.

All questions carry equal marks.

1. What do you understand by Degradation of Polymers ? Explain the following with examples :
 - (a) Thermal Degradation
 - (b) Chemical Degradation
 - (c) Photodegradation (20)

2. Discuss the following techniques of polymerisation with suitable examples :
 - (a) Bulk Polymerisation

P.T.O.

(b) Suspension Polymerisation

(c) Emulsion Polymerisation (20)

3. Distinguish between addition and condensation polymerization. Derive and explain the kinetic equation for vinyl radical polymerization. (20)
4. Discuss the mechanism of cationic polymerization. Derive the kinetic equation for cationic polymerization taking suitable examples. (20)
5. What are copolymers? Write their important technical applications. Obtain expression for the kinetics of copolymerization. How does the reactivity ratio of monomers affect the copolymerization reactions? (20)
6. What are Ziegler-Natta catalysts? How do these catalysts help in obtaining stereoregular polymers? Draw and explain the stereochemical configurations of isotactic, syndiotactic and atactic polymers. (20)
7. (a) Explain how degree of polymerization for a polycondensation reaction varies with the extent of polymerization.

- (b) For a poly condensation reaction, show that the extent of reaction that should be attained to get a minimum yield of a particular molecular mass product is $p_x = \frac{x-1}{x+1}$, where p_x represents the extent of reaction required to obtain x-mer.

(20)

8. Write short notes on any **three** of the following :

(a) Degree of polymerization

(b) Anionic polymerization

(c) Ring-opening polymerization

(d) Molecular weights of polymers

(e) Chemical reactions of polymers

(20)