



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 6th Semester Examination, 2022

DSE-P3-CHEMISTRY

POLYMER CHEMISTRY

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
All symbols are of usual significance.*

Answer any four questions from the following

10×4 = 40

1. (a) What are the different molecular forces found in polymers? 3
 (b) Draw the structure of isotactic, syndiotactic and atactic polypropylene. 3
 (c) Discuss the texture of polymers. 4

2. (a) What are initiators? Write down the free radicals formed by the decomposition of Benzoyl peroxide and Azobis isobutyronitrile. 3
 (b) Explain the mechanism of cationic polymerisation taking Isobutylene as an example. 4
 (c) What is ring opening polymerisation? Give an example. 3

3. (a) What are living polymers? What are their applications? 2+2
 (b) What are Ziegler-Natta catalysts? Give examples. 2
 (c) What are the types of co-polymers formed when 2
 (i) $r_1 = r_2 = 0$ and (ii) $r_1 = r_2 = 1$?
 Where r_1 and r_2 have their usual meanings.
 (d) What are the differences between cationic and anionic polymerisation? 2

4. (a) Distinguish between thermoplastics and thermosetting plastics. Give examples of both. 3
 (b) Write down the repeating unit of the following polymers. 1
 (i) Poly (vinyl acetate)
 (ii) Poly (methyl methacrylate)
 (c) Write notes on: 2+2
 (i) Degree of polymerisation
 (ii) Functionality

- (d) What are cross linked polymers? Give an example of cross linked polymers. 2
5. (a) Explain the kinetics of free-radical polymerisation and derive the equation for the rate of polymerisation. 4
- (b) Define kinetic chain length. 2
- (c) What are the major differences between addition and condensation polymerisation? 2
- (d) What are the properties of polyvinyl acetate? 2
6. (a) Molecular weight of a polymer is expressed as an average. — Why? 2
- (b) How will you calculate intrinsic viscosity? 4
- (c) What is the practical importance of polymer molecular weight? 1
- (d) Two polymers of molecular weight 10,000 and 100,000 are mixed together so that equal number of molecules are added, determine \bar{M}_n and \bar{M}_w . 3

—x—