2026

CHEMISTRY

(Major)

Paper : CHE4200304MJ

(Polymer Chemistry)

Full Marks : 45

Time : 2 hours

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The figures in the margin indicate the full marks for the questions.

1. Answer the following questions : 1×5=5

(a) Name one conducting polymer.

(b) Coordination polymerization is homogeneous in nature.

(Write *True / False*)

(c) What is the functionality of CH═CH?

(d) Name the monomer for the preparation of Nylon-6 polymer.

(e) Define isotactic polymer.

2. Answer *any five* of the following questions : 2×5=10

(a) Distinguish between thermosetting and thermoplastic polymers.

(b) How HDPE and LDPE differ in their properties?

(c) What are biodegradable polymers? Give examples.

(d) Which factors affect glass transition temperature of polymer?

(e) Write WLF equation and mention its significance.

(f) What is PDI? Explain.

(g) Explain crystalline melting point of polymer.

(h) How do homopolymers differ from copolymers?

(i) Give one method of preparation of polystyrene.

(j) Name two polymerization techniques.

3. Answer *any four* of the following questions : 5×4=20

(a) Explain in detail the factors affecting the degree of crystallinity.

(b) Explain Flory-Huggins theory and the condition for miscibility of polymers.

(c) Explain the kinetics of an anionic polymerization.

(d) Establish the relation between extent of polymerization and degree of polymerization.

(e) Give an account of classification of polymers on the basis of intermolecular forces.

(f) What do you mean by linear, branched and cross-linked polymers? Give one example for each. 3+2=5

(g) Write a short note on 'Texture of polymers'.

(h) Define functionality of a monomer. What is its importance? 2+3=5

4. Answer any *one* of the following questions : 10

(a) Give preparation and uses of the following : 2×5=10

(i) Teflon

(ii) PVC

(iii) Bakelite

(iv) Nylon-6

(v) Novalac

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(b) State and explain the determination of molecular weight of polymers by osmotic pressure and light scattering methods. 5+5=10

(c) Write notes on the following : 2×5=10

(i) Glass transition temperature

(ii) Condensation polymerization

(iii) Monomers

(iv) Copolymerisation

(v) Number average molecular weight

(d) (i) Define solubility parameter. How does the crystallinity and flexibility of the polymer chain affect the solubility of a polymer? 1+4=5

(ii) Explain the mechanism of cationic polymerization. 5

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