KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages) **Reg. No:……**

Question Code: 26E02205 **Course Code : 24PECH41**

PG Degree - End Semester Examinations, April 2026

Fourth Semester

M.Sc., CHEMISTRY

Polymer Chemistry

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K:1 1. T_g stands for _____

(a) Phase Temperature (b) Gas Temperature

(c) Glass Transition temperature (d) Grade Transition temperature

CO:1 K:1 2. Which among the following represents the total weight of a polymer sample divided by the total number of molecules present?

(a) Weight average Molecular mass (b) Number average Molecular mass

(c) Sample Average Molecular Mass (d) Thermal average molecular Mass

CO:2 K:1 3. The initiator commonly used in cationic polymerization is

(a) Benzyolperoxide (b) Monomer

(c) Lewis acid (d) Lewis base

CO:2 K:2 4. Ziegler–Natta catalysts are typically composed of

(a) Transition metalchloride

(b) Alkali metal ions

(c) Transition metal chloride + alkyl aluminium compounds.

(d) Alkali metal ions + alkyl aluminium compounds.

CO:3 K:2 5. Photo degradation of polymers is caused by

(a) Heat (b) Mechanical force

(c) UV Light (d) Moisture

CO:3 6. Which polymerization is called pearl polymerization?

K:2

(a) Suspension (b) Bulk

(c) Solution (d) Emulsion

CO:4 7. Which is used to make pipes?

K:1

(a) Polyethylene (b) PVC

(c) Buna - S (d) Polyimides

CO:4 8. Buna-N is a copolymer of

K:1

(a) Butadiene and styrene (b) Butadiene and acrylonitrile

(c) Isoprene and styrene (d) Isoprene and acrylonitrile

CO:5 9. Calendaring is mainly used to produce _____

K:1

(a) Bottles (b) Thin Films and Sheets

(c) Fibers (d) Foams

CO:5 10. Basic catalysts are generally used in _____

K:2

(a) Cationic polymerization (b) Anionic polymerization

(c) Radical polymerization (d) Emulsion polymerization

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

CO:1 11. (a) Examine the Cohesive energy density in Polymers.

K:4

(OR)

(b) How will you determine the molecular mass of polymers by Number Average molecular mass?

CO:2 12. (a) Develop the mechanism for cationic polymerization.

K:3

(OR)

(b) Identify a suitable example and explain the step growth polymerization technique.

CO:3 13. (a) With the help of neat diagram, explain Bulk polymerization.

K:3

(OR)

(b) Analyse the degradation of polymer and a mechanical stress.

CO:4 14. (a) How will you prepare the following i) Nylon ii) Bakellite

K:4

(OR)

(b) Examine the role of Polyurethanes and polymethyl methacrylate polymers.

CO:5 K:4 15. (a) Inspect the role of polymer supported catalytic reaction in detail.

(OR)

(b) Compare Blow and Injection molding process.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 600 words.

CO:1 K:4 16. (a) Analyze the determination of the Molecular weight of the higher polymers using physical methods.

(OR)

(b) Examine the primary bonding forces exist in polymers.

CO:2 K:6 17. (a) Elaborate the Ziegler Natta polymerization.

(OR)

(b) Propose a suitable mechanism for the free radical polymerization.

CO:3 K:4 18. (a) Organize Emulsion and Suspension polymerizations in detail.

(OR)

(b) Identify photo degradation and the role of photostabilizers in detonation of polymers.

CO:4 K:5 19. (a) Explain the preparation of Poly Vinyl Chloride, Polyethylene, Polypropylene and Polystyrene in detail.

(OR)

(b) Justify the importance of conducting polymers with suitable examples.

CO:5 K:5 20. (a) Defend the need of reinforcing in polymersation.

(OR)

(b) Interpret the role of compounding process in polymerization.