G 243

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003.

Fourth Semester

Textile Technology

(Common to Textile Chemistry)

CH 248 — POLYMER CHEMISTRY

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate a homopolymer from a co-polymer.

2. Define the term : Degree of polymerization.

3. What are inhibitors?

4. What are graft copolymers?

5. What is meant by polydispersity index?

6. What is a crystallite?

7. How will you prepare polypropylene?

8. What is ABS polymer?

9. Explain the term compounding.

10. What is foaming?

PART B — (5 × 16 = 80 marks)

11. (i) Write a brief account of crystallinity of polymers. (6)

(ii) What is glass transition temperature? Explain. (5)

(iii) Discuss the mechanical properties of polymers. (5)

12. (a) (i) How are polymers classified based on their origin, chemical composition and use? (8)

(ii) Define the term functionality of monomers. Explain its significance in forming polymers with different types of structures. (8)

Or

(b) (i) What is Tacticity? Explain the following terms :

(1) Isotactic polymers

(2) Atactic polymers

(3) Syndiotactic polymers. (8)

(ii) Write the structure of the monomers and polymers for

(1) Polyisoprene

(2) Polyacrolein

(3) Polyacrylonitrile

(4) Polystyrene. (8)

13. (a) (i) Discuss the mechanism involved in free-radical polymerisation. (8)

(ii) Write a brief account of

(1) Solution polymerization

(2) Suspension polymerization. (4 + 4)

Or

(b) (i) Discuss in detail the effect of polymer structure on the properties like physical state, plastic deformation and chemical resistance. (9)

(ii) What is coordination polymerization? Explain the mechanism of coordination polymerization. (7)

14. (a) (i) How is polyethylene obtained? Distinguish LDPE from HDPE. Discuss their characteristics. (8)

(ii) What are polycarbonates? How are they prepared? Mention their uses. (8)

Or

(b) (i) How are the following polyamides synthesized?

(1) Nylon 6 : 6

(2) Kevlar. (8)

(ii) How are polyurethanes obtained? Discuss their characteristics and uses. (8)

15. (a) (i) With a neat sketch explain extrusion moulding. (8)

(ii) What is fibre spinning? Explain dry spinning process. (8)

Or

(b) (i) Write a brief note on :

(1) Flame retardants

(2) Heat stabilizers

(3) Fibre-reinforced plastics. (9)

(ii) With a neat sketch, explain pultrusion technique. (7)
