LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIFTH SEMESTER – **APRIL 2023**

CH 5402 – POLYMER CHEMISTRY

Date: 11-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

Part-A

Answer ALL questions. **(10 × 2 = 20)**

1. What is polydispersity index?
2. Define cohesive energy.
3. What is living polymer?
4. Cite commonly used initiators in cationic polymerization.
5. Comment on the mastication of rubber under nitrogen atmosphere.
6. Write the limitations of bulk polymerization.
7. Cite the uses of neoprene.
8. What are elastomeric materials?
9. Mention any two organic and inorganic colorants used with polymers.
10. Mention the role of antioxidant in polymers.

Part-B

Answer any EIGHT questions. **(8 × 5 = 40)**

11. Derive the formula for weight average molecular weight of polymers.
12. Explain tacticity in polypropylene.
13. Describe the mechanism of radical polymerization of ethylene.
14. Explain the anionic mechanism of polymerization of acrylonitrile.
15. Illustrate the suspension polymerization.
16. Discuss the polymer degradation involving substituent groups in PVC.
17. Write the synthesis, properties and uses of polyester.
18. Illustrate the synthesis of Buna-S and Buna-N.
19. Explain gas phase polymerization with suitable diagram.
20. Describe the processing and vulcanization of natural rubber.
21. Discuss the role, characteristics, and advantages of fillers.
22. Write a short note on reinforcing polymers.

Part-C

Answer any FOUR questions. **(4 × 10 = 40)**

23. Discuss the primary and secondary bond forces in polymers.
24. Explain the detailed mechanism of Ziegler-Natta polymerization of propylene.
25. How are polymers synthesized by solution and emulsion polymerization techniques? Mention their advantages and limitations.

26a. How is nylon synthesized? Give the characteristics and uses. (6)

b. Comment on the synthesis of the following monomers:
(i) vinyl chloride, (ii) tetrafluoro ethylene. (4)

27. How are polymers processed by compression and blow moulding techniques? Explain with suitable diagram.

28a. Write a short note on thermal degradation of polymers. (5)

b. Describe the calendering process with suitable diagram. (5)

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