



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – NOVEMBER 2015

CH 5402 - POLYMER CHEMISTRY

Date : 13/11/2015
Time : 09:00-12:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2 = 20)

1. Define copolymer.
2. What is functionality of a monomer?
3. Give any two commonly used initiators in anionic polymerization.
4. What is meant by a living polymer?
5. Mention the types of polymer degradation.
6. Account for the heat withstanding ability of Teflon.
7. What are fibres?
8. Expand the following terms: (i) HDPE (ii) PMMA.
9. What is compounding?
10. Mention the role of plasticizer in polymers.

Part-B

Answer any EIGHT questions.

(8 × 5 = 40)

11. Describe the free radical mechanism of polymerization of ethylene.
12. Draw and explain the structures of isotactic, syndiotactic and atactic polymers.
13. Classify and explain the polymers based on their thermal behaviour.
14. Explain the cationic mechanism of polymerization of styrene.
15. How is epoxy resin synthesized? Mention its uses.
16. Describe the processing and vulcanization of natural rubber.
17. Write the synthesis, properties and uses of nylon 66.
18. Explain the mechanical degradation of rubber in oxygen and nitrogen atmospheres.
19. Explain the gas phase polymerization with a suitable diagram.
20. Write a short note on conducting polymers.
21. Explain the calendering process with a suitable diagram.
22. What are polymer additives? Mention the advantages of fillers.

Part-C

Answer any FOUR questions.

(4 × 10 = 40)

23. Discuss the primary and secondary bond forces in polymers.
24. Derive the formulae for number and weight average molecular weight of polymers.
25. Explain the detailed mechanism of Ziegler-Natta polymerization of propylene.
26. Give the preparation and properties of the following polymers:
(i) neoprene (ii) phenol-formaldehyde resin. **(4+6)**
- 27a. Write the salient features of fibre reinforced polymers. **(4)**
b. Describe the process of interfacial polymerization technique. **(6)**
- 28a. How are polymers processed in injection moulding technique? Explain it with a suitable diagram. **(6)**
b. How does antioxidant protect the polymer? Give the structure of any one antioxidant. **(4)**
