



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – APRIL 2018

CH 5402- POLYMER CHEMISTRY

Date: 08-05-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part A

Answer ALL questions.

(10 x 2 = 20)

1. What is monomer functionality?
2. Define degree of polymerization.
3. What is the general structure of isotactic and syndiotactic polymers?
4. Give the names of any two initiators used in free radical polymerization.
5. Define unzipping in polymer degradation.
6. Provide an example for a polymer prepared by interfacial polymerization.
7. Differentiate between thermo and thermo setting plastics.
8. What are elastomers?
9. What is compounding?
10. Mention the names of any two plasticizers used in polymers.

Part B

Answer any EIGHT questions.

(8 x 5 = 40)

11. Discuss briefly the secondary bond forces in polymers
12. Calculate the Number Average and Weight Average molecular weights of a polymer containing equal amounts of molecules with molecular weights $M_1 = 10,000$ and $M_2 = 100,000$.
13. Describe the mechanism of cationic polymerization of styrene
14. Provide a comparative account of addition and condensation polymerizations.
15. Write the synthesis, properties and uses of nylon 66.
16. Explain the role of photo stabilizers in polymers.
17. Discuss the different types of polymer degradation.
18. Describe the processing and vulcanization of natural rubber
19. What are thermosetting plastics? Describe the synthesis of epoxy resins.
20. Write a short notes on conducting polymers.
21. What are polymer additives? Mention the advantages of fillers.
22. Explain calendaring process with a suitable diagram.

Part C

Answer any FOUR questions.

(4 x 10 = 40)

23. Derive the formulae for number and weight average molecular weight of polymers.
24. Discuss the mechanisms of Ziegler-Natta polymerization with a suitable example.
- 25a. How are polymers synthesized by solution and emulsion polymerization techniques? Mention their advantages and limitations (6)
- b. Write the synthesis of Buna-N and Buna-S (4)
- 26a. How does antioxidant protect the polymer? Give the structure of any one antioxidant. (4)
- b. Discuss the synthesis, doping and conductivity of polypyrroles. (6)
27. Describe the different polymerization processes using moulding technique with suitable diagrams.
28. Enumerate the preparation and properties of polypropylene and phenol formaldehyde resin.
