



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

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

**FIFTH SEMESTER – NOVEMBER 2016**

**CH 5402 - POLYMER CHEMISTRY**

Date: 09-11-2016  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

**Part-A**

**Answer ALL questions.**

**(10 × 2 = 20)**

1. What are cross-linked polymers?
2. What is polydispersity index?
3. Polymerisation of styrene follows cationic mechanism whereas acrylonitrile follows anionic mechanism. Comment.
4. Mention the advantages of bulk polymerization technique.
5. Comment on the role of polyvinyl alcohol in pearl polymerization.
6. Mention the types of degradation pathways.
7. What are elastomers?
8. What are thermosetting polymers?
9. Cite any four inorganic colourants used in polymer processing.
10. What is meant by reinforced polymer?

**Part-B**

**Answer any EIGHT questions.**

**(8 × 5 = 40)**

11. Discuss briefly the secondary bond forces in polymers.
12. Describe the free radical mechanism of polymerization of propylene.
13. List out the differences between addition and condensation polymerizations.
14. Explain the anionic mechanism of polymerization of acrylonitrile.
15. What is tacticity? Sketch and explain the structure of different types of tactic polymers.
16. Why does photodegradation of PVC exhibit different colours? Explain the chemical reactions involved.
17. Explain the role of photostabilizers in polymers.
18. How is epoxy resin synthesized? Mention its uses.
19. Describe the processing and vulcanization of natural rubber.
20. Give an account of synthesis, properties and uses of PETP.
21. How are storage containers prepared by blow moulding technique?
22. Describe the calendaring process with suitable diagram.

**Part-C**

**Answer any FOUR questions.**

**(4 × 10 = 40)**

23. Derive the formula for weight- and number average molecular weight of polymers.
- 24a. Describe the synthesis of polyamides by interfacial polymerization. **(6)**
  - b. Write a short note on copolymerization. **(4)**
- 25a. Describe the gas phase polymerization with suitable diagram. **(6)**
  - b. Explain the solution polymerization. **(4)**
- 26a. Write the synthesis of Buna-S and Buna-N. **(4)**
  - b. Outline the synthesis, doping and conductivity of polypyrroles. **(6)**
- 27a. Demonstrate the polymer processing in injection moulding technique with suitable diagram. **(6)**
  - b. How does antioxidant protect the polymer? Give the structure of an antioxidant. **(4)**
28. Write the preparation of Ziegler-Natta catalyst. Explain the bimetallic mechanism of Ziegler-Natta catalyzed polymerization of propylene.

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