



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

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

**FIFTH SEMESTER – NOVEMBER 2017**

**CH 5402 - POLYMER CHEMISTRY**

Date: 13-11-2017  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

**Part-A**

*Answer ALL questions.*

**(10 × 2 = 20)**

1. What is the functionality of a monomer?
2. All polymer systems are polydisperse. Comment.
3. Mention any two initiator molecules used in free radical polymerization.
4. Define cohesive energy.
5. What is compounding?
6. Mention the types of degradation pathways.
7. Expand the following terms: (i) HDPE (ii) PMMA.
8. Why does PTFE show high heat resistance?
9. Comment on the role of plasticizer in a polymer.
10. What are the characteristics of photostabilizers?

**Part-B**

*Answer any EIGHT questions.*

**(8 × 5 = 40)**

11. Draw and explain the structures of isotactic, syndiotactic and atactic polymers.
12. Write the differences between addition and condensation polymerizations.
13. Explain cross linked and living polymers.
14. Discuss gas phase polymerization with suitable diagram.
15. Describe the processing and vulcanization of natural rubber.
16. How is epoxy resin synthesized? Mention its uses.
17. Write a short note on conducting polymers.
18. Why does photodegradation of PVC exhibit different colours? Explain the chemical reactions involved in it.
19. Outline the synthesis, doping and conductivity of polypyrroles.
20. How are storage containers prepared by the process of blow moulding?

21. Explain the role of colourants and fillers in polymer processing.
22. Write the synthesis, properties, and uses of neoprene rubber.

### **Part-C**

*Answer any FOUR questions.*

**(4 × 10 = 40)**

23. Derive the formulae for number and weight average molecular weight of polymers.
- 24a. Discuss briefly the secondary bond forces in polymers. (5)
  - b. Describe the free radical mechanism of polymerization of propylene. (5)
- 25a. How is phenol-formaldehyde resin synthesized? Mention its uses. (5)
  - b. Give an account of synthesis, properties and uses of PETP. (5)
26. Discuss the preparation, properties and uses of the following (i) Buna-S (ii) Nylon. (4+6)
- 27a. Describe the process of die-casting. (5)
  - b. Classify and explain the polymers based on their thermal behaviour. (5)
28. Explain the detailed mechanism of Ziegler-Natta polymerization of propylene.

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