



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – APRIL 2017

CH 5402- POLYMER CHEMISTRY

Date: 02-05-2017
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2 = 20)

1. State the criterion of a monomer.
2. All polymer systems are polydisperse. Comment.
3. Mention the types of polymerization reactions.
4. Write the limitations of bulk polymerization.
5. Define unzipping in polymer degradation.
6. What are the characteristics of photostabilizers?
7. List out the factors influencing the conducting ability of a polymer.
8. Cite few additives used in rubber processing.
9. Define compounding.
10. Mention the role of plasticizers in polymers.

Part-B

Answer any EIGHT questions.

(8 × 5 = 40)

11. Describe the free radical mechanism of polymerization of ethylene.
- 12a. State the significances of cohesive energy density parameter of a polymer. (3)
 - b. Mention the criterion for fibres in terms of length and diameter. (2)
13. Write a short note on solution polymerization and copolymerization.
14. Derive the formula for weight average molecular weight of polymers.
15. Why does photodegradation of PVC exhibit different colours? Explain and write the chemical reactions involving in it.
16. Explain the mechanical degradation of rubber in the presence of oxygen- and nitrogen atmosphere.
17. How is epoxy resin synthesized? Mention its uses.
18. Describe the processing and vulcanization of natural rubber.
19. How are storage containers prepared by the process of blow moulding? Explain.
20. Describe the calendering process with suitable diagram.

21. Write the synthesis, properties, and uses of neoprene rubber.
22. How is phenol-formaldehyde resin synthesized? Mention its uses.

Part-C

Answer any FOUR questions.

(4 × 10= 40)

23. Discuss about the primary and secondary bond forces in polymers with suitable examples.
- 24a. List out the differences between addition and condensation polymerisations. (5)
 - b. Explain the anionic mechanism of polymerization of acrylonitrile. (5)
- 25a. How are polymers synthesized by emulsion polymerization technique? Explain. (5)
 - b. Review the methods available for the production of FRP. (5)
26. Give the preparation, properties, and uses of the following polymers:
 - (i) Terylene (ii) Nylon. (4+6)
- 27a. How are polymers processed in injection moulding technique? Explain with suitable diagram. (5)
 - b. Explain the role of colourants and fillers in polymer processing. (5)
28. Write the preparation of Ziegler-Natta catalyst. Explain the bimetallic mechanism of Ziegler-Natta catalyzed polymerization of propylene.

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