LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **APRIL 2014**

CH 5402/5400 - POLYMER CHEMISTRY

Date : 09/04/2014   Dept. No.   Max. : 100 Marks
Time : 01:00-04:00

Part-A
Answer *all* the questions. Each carries *two* marks.

1. What are graft copolymers?
2. Draw the structure of azo*bis*(isobutyronitrile) and its free radical.
3. Arrange the following polymers in the increasing order of their thermal stability and give reasons: poly-α-methyl styrene, polyethylene, and polystyrene.
4. Define critical micelle concentration.
5. What are thermosetting polymers?
6. Define cohesive energy.
7. Why is anionic polymerization called living polymerization?
8. Expand the abbreviations: PTFE and ABS.
9. Teflon can withstand temperatures. Substantiate.
10. Mention any two properties of fiber reinforced plastics.

Part-B
Answer any *eight* questions. Each carries *five* marks.

11. Explain the mechanism of Ziegler-Natta polymerization.
12. Differentiate the following: (a) natural and synthetic polymers, (b) linear and branched polymers.
13. Explain syndiotactic and isotactic polymers in detail.
14. Discuss the various modes of addition of monomers in the propagation step of free radical polymerization.
15. Write a short note on step growth polymerization.
16. Describe bulk polymerization in detail.
17. Explain the factors that affect the thermal stability of polymers.
18. Give an account on the mechanical degradation of polymers.
19. Write a note on calendering.
20. Explain the process of compression moulding.
21. Describe the preparation and salient features of PVC.
22. Explain the synthesis of the polymers PMMA and nylon.

Part-C
Answer any *four* questions. Each carries *ten* marks.

23. Discuss the following:
    (a) Interfacial condensation polymerization,
    (b) Solution polymerization.   (5+5)
24a. Howare novolak resins prepared by acid and alkali catalyzed reactions?
  b. Why is PTFE is a linear polymer? Mention its advantages.   (6+4)
25a. How is the weight average molecular weight of a polymer determined?
  b. What are copolymers? Write a note on random and alternating copolymers. (5+5)
26. Write a detailed account on the mechanism of cationic polymerization.
27a. Explain the role of fire retardant and colorants in polymer additives.
  b. Give an account of photodegradation of polymers.   (5+5)
28. Explain (a) injection moulding and (b) blow moulding.   (5+5)

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