

SIXTH SEMESTER B.A/B.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCBCSS—UG)

Chemistry

CHE 6B 13 (E2)—POLYMER CHEMISTRY

Time : Three Hours

Maximum : 80 Marks

Section A (One word)*Answer all questions.**Each question carries 1 mark.*

1. Give two examples for natural polymers.
2. What is tacticity ?
3. Write another name for Ziegler-Natta polymerisation.
4. The monomer of Orlon is _____.
5. Write the mathematical expression for polydispersity index.
6. Which is the first step of thermal degradation of PVC ?
7. Mention one example for thermoplastic used in injection moulding.
8. Draw the structure of the monomer of PMMA.
9. Give one important use of glyptal.
10. Name one absorbable synthetic polymer used as suture thread.

(10 × 1 = 10)

Section B (Short Answer)*Answer any ten questions.**Each question carries 2 marks.*

11. What are isotactic polymers ? How are they generated ?
12. Schematically represent a homopolymer and a branched polymer.
13. Explain the polymerisation of vinyl chloride.
14. Write the general mechanism of anionic addition polymerisation.
15. What is glass transition temperature in polymers ? Mention two factors affecting it.
16. What is vulcanisation of rubber ?
17. What is meant by viscoelasticity of polymers ?

Turn over

18. What is calendaring in polymerisation process ?
19. How is silicone rubber prepared ?
20. How different kinds of plastics are identified by their codes ?
21. What are carbon fibres ? Give any *two* applications.
22. What are high temperature polymers ?

(10 × 2 = 20 marks)

Section C (Paragraph)

*Answer any five questions.
Each question carries 6 marks.*

23. Citing suitable examples give an account of various methods of synthesis of polymers.
24. Discuss in detail the mechanism of Zeigler-Natta polymerisation.
25. Give an account of weight average and number average molecular weights of polymers.
26. Describe rotational and blow moulding.
27. Write the method preparation of :
 - (i) Butyl rubber.
 - (ii) Teflon.
 - (iii) Phenol-formaldehyde resin.
28. Write briefly on recycling of plastics.
29. Give a brief account of the structure, properties and uses of LDPE and HDPE.
30. Write a short note on conducting polymers.

(5 × 6 = 30 marks)

Section D (Essays)

*Answer any two questions.
Each question carries 10 marks.*

31. Citing suitable examples describe in detail the classification of polymers based on intermolecular forces.
32. Give a detailed account of ring opening and group transfer polymerisations.
33. Write an account of thermal, photo and oxidative degradation of polymers.
34. Describe any *four* polymerisation techniques.

(2 × 10 = 20 marks)