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Sixth Semester B.Sc. Degree Examination, April 2022.

First Degree Programme under CBCSS

Chemistry

Elective Course

CH 1661.3 – POLYMER CHEMISTRY

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark.

1. Define glass transition temperature.
2. Name any one UV stabilizer.
3. What is PVC?
4. Write one example for thermosetting polymer.
5. What do you mean by the aspect ratio of a fibre?
6. Give an example for a silicone polymer.
7. What is the basic unit in natural rubber.
8. Name the transparent polymer developed in 1912.

P.T.O.

9. What is HDPE?

10. What are the monomers of Nylon-66?

(10 × 1 = 10 Marks

SECTION – B

Answer **any eight** questions, each question carries **2** marks

11. Describe the properties and uses of polyurethane.

12. Explain electro spinning process.

13. How carboxy methyl cellulose (CMC) is prepared?

14. What are antioxidants? Give any two examples.

15. Write notes on mechanical properties of elastomers.

16. How epoxy resin is prepared?

17. Comment on different classes of polyethylene.

18. Explain the factors affecting the glass transition temperature.

19. What is a living polymer? Give one example.

20. Explain the principle of coordination polymerization.

21. What is crystallization of polymers? Name any two crystallization techniques.

22. What is ceiling temperature?

23. Comment on cross linking of polymers. Name any one cross linking agent used for vinyl polymerization.

24. Write Flory equation and explain the terms

25. What is ring opening polymerization? Give an example.

26. What is heat distortion temperature?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions, each question carries **4** marks

27. Derive the equation for number average and weight average molecular weight determinations of polymers

28. What is vulcanization? Comment on different classes of rubber compounding chemicals.

29. Compare the initiation and termination mechanisms of cationic and free radical polymerizations.

30. Explain the synthesis, properties and applications of amino resins taking suitable example

31. Write notes on (a) Regenerated cellulose (b) Teflon.

32. What are elastomers? Write notes on physical properties of elastomers.

33. Discuss the preparation, structure, applications and environmental impact of PVC

34. What is polymer degradation? Write notes on any three degradation methods.

35. What are fillers and plasticizers? How are they classified? Explain their role in polymer processing?

36. Write notes on synthesis and curing of epoxy resins.

37. What are plastics? How are they classified? Give examples for each type.

38. Describe the advantages and disadvantages of compression molding and injection moulding of thermosetting materials.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions, each question carries **15** marks

39. (a) Explain Ziegler Natta polymerization of propylene describing its mechanism.

    (b) Draw the different stereo isomeric forms of polypropylene.

40. What is rheology? Explain any five polymer processing techniques.

41. Briefly describe the kinetics of free radical and anionic polymerizations.

42. How is PVA and PET synthesized? Briefly describe the mechanism and applications of each polymer.

43. What is polymerization? Illustrate different methods of polymerization techniques using suitable examples.

44. What are thermoplastic polymers? Explain the synthesis of polystyrene and any two copolymers of polystyrene.

(2 × 15 = 30 Marks)
