K23P 1378

Reg. No. : .....

Name : .....

III Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.)
Examination, October 2023
(2020 Admission Onwards)
CHEMISTRY
CHE 3E 03 : Polymers and Material Chemistry

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **one** mark.

1. What are living polymers ?
2. Write the structure of Ziegler Natta catalyst.
3. What is intrinsic viscosity of polymer solutions ?
4. What do you mean by end group analysis of polymer ?
5. What are graft and block polymers ?
6. Give any one method for the functionalization in polystyrene.
7. What are casting alloys ?
8. Give two examples of zinc base alloys. **(8×1=8)**

SECTION – B

Answer **any eight** questions. Answer may be **two** or **three** sentences. **Each** question carries **two** marks.

9. What is ring opening polymerization ? Illustrate using suitable examples.
10. What is gel point ? How it is determined experimentally ?

P.T.O.

11. What are syndiotactic polymers ? Give examples.

12. Define Flory Huggins theory of polymer solutions.

13. How will you calculate the molecular weight of polymer solutions using lowering of vapour pressure method ?

14. Define number average molecular weight of polymers. How it is determined ?

15. Explain the hydrolytic degradation of polymers.

16. How cross linking reactions in polymers are carried out ? Explain using suitable examples.

17. What are polymer blends ? Give two examples.

18. What are bearing materials ? Explain any one type of bearing material.

19. What is latent functionality ?

20. Write a short note on the classification of ceramics. **(8×2=16)**

SECTION – C

Answer **any four** questions. Short paragraph questions. **Each** question carries **three** marks.

21. Discuss the mechanism of coordination polymerization.

22. Write notes on the types of molecular forces and chemical bonding in polymers.

23. How will you determine the molecular weight of polymers by osmotic pressure method ?

24. Explain the various types of post reactions of polymers.

25. What is suspension polymerization ? What are its advantages ?

26. What are refractory materials ? Write notes on tantalum based refractory materials. **(4×3=12)**

SECTION – D

Answer **any four** questions. Essay type questions. **Each** question carries **six** marks.

27. A) Discuss the kinetics and mechanism of radical chain polymerization.

OR

B) Define glass transition temperature. What are the factors influencing glass transition temperature ? How glass transition temperature influences the properties of polymers ?

28. A) Explain the light scattering method for the determination of molecular weight of polymers.

OR

B) What is the principle of gel permeation chromatography ? How GPC is used for the fractionation and molecular weight determination of polymers ?

29. A) Explain briefly on thermal, mechanical, photo and oxidative degradation of polymers.

OR

B) Write notes on gas phase polymerization, bulk polymerization and emulsion polymerization.

30. A) Explain the various mechanical, thermal, optical, electrical and magnetic properties of engineering materials.

OR

B) What are composite materials ? How are they classified ? Briefly explain the applications of composite materials. **(4×6=24)**