



Reg. No. :

Name :



K20P 1082

**III Semester M.Sc. Degree (CBSS – Reg./Suppl./Imp.)
Examination, October 2020
(2014 Admission Onwards)
CHEMISTRY
CHE 3E.03 : Polymers and Material Chemistry**

Time : 3 Hours

Max. Marks : 60

SECTION – A

Answer **all** questions. **Each** question carries **one** mark :

1. How does cellobiose differ from maltose ?
2. What are the starting materials for Bakelite ?
3. Polydispersity index of a polymer is unity. What does it mean ?
4. Name any material which is used as the gel in gel permeation chromatography.
5. Show a curing reaction of any one polymer.
6. Why PVC is highly susceptible to thermal degradation ?
7. Give an example of a hybrid composite.
8. Give the composition of a copper base casting alloy. (8×1=8)

SECTION – B

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

9. Give an example of ring opening polymerization.
10. What is glass transition temperature of polymers ?

P.T.O.



11. What is the basic structural difference between starch and cellulose ?
12. Differentiate between weight average molecular weight and number average molecular weight.
13. What is the driving force for polymer solubility ?
14. Name the factors which affect the swelling of polymers.
15. What are polymer blends ? Give examples.
16. Give an example for hydrolytic degradation of polymer.
17. Give two specific examples for the reaction of functional groups on polymeric chains.
18. Comment about optical property of any specific engineering material.
19. Classify ceramic materials.
20. Distinguish between ferromagnetism and paramagnetism. (8×2=16)

SECTION – C

Answer **any four** questions, **each** in a paragraph. **Each** question carries **3** marks :

21. How various intermolecular forces affect the physical properties of polymers ?
22. Illustrate how Ziegler Natta catalyst can be employed to synthesize an isotactic polymer.
23. Discuss the relevance of measurement of viscosity of polymer solution.
24. Explain briefly the principle and process of ultracentrifugation of a polymeric product.
25. Briefly explain two vulcanization methods used in rubber industry.
26. Discuss the bulk polymerization process and list the advantages and drawbacks.
27. Write a short note on the bearing materials.
28. Demonstrate the importance of refractories, taking the example of tungsten based materials. (4×3=12)



SECTION – D

Answer either **A** or **B** of **each** question. **Each** question carries **6** marks :

29. A) Explain briefly the mechanism and kinetics of radical chain polymerization.
OR
B) Enumerate and discuss the mechanical properties exhibited by crystalline polymers.
30. A) Discuss the Flory Huggins theory of polymer solution.
OR
B) How the measurement of colligative properties can be utilized to calculate the average molecular weight of polymers ?
31. A) Discuss various methods of degradation of polymers.
OR
B) Discuss the importance of various types of post-synthetic modification of polymers.
32. A) List and elaborate various die-casting alloys used in the tool and die industry.
OR
B) Write a note on the properties and applications of various classes of composite materials. (4×6=24)