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R – 1279

Reg. No. : .....

Name : .....

**Sixth Semester B.Sc. Degree Examination, April 2023**

**First Degree Programme under CBCSS**

**Chemistry/Chemistry and Industrial Chemistry**

**Elective Course**

**CH 1661.3/IC 1661.3 : POLYMER CHEMISTRY**

**(CH 1661.3 : 2013-2016 Admission & IC 1661.3 : 2013 Admission onwards)**

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. What is natural rubber?
2. What are the uses of polypropylene?
3. Give the monomers used in the synthesis of ABS.
4. Give an example for a copolymer.
5. What is a thermosetting polymer?
6. What is Nylon 66?
7. What are the advantages of vulcanization of rubber?

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8. Give an example for a polyester.
9. What is Buna-N?
10. Write the structure of polystyrene.

(10 × 1 = 10 Marks)

### PART – B

Answer **any eight** questions. Each question carries **2** marks.

11. Write a note on polyurethane.
12. What is Neoprene? Give its structure.
13. How Nylon 6 is synthesized?
14. What is homogeneous polymerization?
15. Give the equation for the weight average molecular weight of a polymer.
16. What is meant by degree of polymerization?
17. What are step growth polymers? Give one example.
18. How are polymers classified based on their structures?
19. What are the advantages of Ziegler-Natta catalyst?
20. Briefly explain the phenomenon of why a rubber ball becomes like glass below  $-70^{\circ}\text{C}$ ?
21. What are the advantages of bulk polymerization?
22. Give any two examples of polymers which can be processed by thermoforming method.

(8 × 2 = 16 Marks)

## PART – C

Answer **any six** questions. Each question carries **4** marks.

23. What are the factors affecting glass transition temperature?
24. What is bakelite? Give its properties and uses.
25. Distinguish between elastomers and fibers.
26. What is the importance of poly dispersity index?
27. Give the properties and applications of polycarbonate.
28. What is meant by the degradation of polymers? Mention their types.
29. What is HDPE? Explain one method of preparation.
30. Write a short note on silicones.
31. Give the comparison between natural rubber and vulcanized rubber.

**(6 × 4 = 24 Marks)**

## PART – D

Answer **any two** questions. Each question carries **15** marks.

32. Write notes on the following polymer processing techniques.
  - (a) Compression moulding
  - (b) Injection moulding
  - (c) Thermoforming.
33. Discuss the properties, synthesis and uses of urea formaldehyde resin, phenol formaldehyde resin and melamine formaldehyde resin.
34. Discuss the preparation, properties and uses of
  - (a) LDPE (b) SBR (c) PVA.
35. Write notes on bulk, emulsion and suspension polymerization techniques.

**(2 × 15 = 30 Marks)**