

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Polymer Chemistry

PCH 6B 02 (E1)—POLYMER PROCESSING AND TECHNOLOGY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answers)*Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What is epoxidized natural rubber ? How is it prepared ?
2. What is crepe rubber ?
3. Write the structure of cellulose acetate ? How is it prepared ?
4. How is latex concentrated by centrifugation ?
5. What is Compounding ?
6. What are Extenders ? Give an example.
7. What are foaming agents ?
8. Mention any two functions of plasticizers.
9. What is the advantage of vulcanization ?
10. What is meant by curing ?
11. Explain melt flow index of polymers.
12. Define tensile strength of a polymer.

(8 × 3 = 24 marks)

Turn over

Section B (Paragraph)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain the preparation of ribbed smoked sheets.
14. Describe the different methods of concentrating latex.
15. Explain thermoforming.
16. What is Casting ? Explain the method of die casting.
17. Explain the process of mixing in rubber processing.
18. What is meant by mastication ? Explain.
19. Describe stress relaxation of polymers.

(5 × 5 = 25 marks)

Section C (Essays)

Answer any one question.

The question carries 11 marks.

20. (i) Explain the composition and structure of natural rubber.
(ii) Write notes on the modified forms of natural rubber.
21. What is Moulding ? Describe the different types of moulding methods in polymer processing.

(1 × 11 = 11 marks)

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Polymer Chemistry

PCH 6B 01—POLYMER CHEMISTRY—I

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answers)*Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What is condensation polymerisation ? Give two examples.
2. What is degree of polymerisation ?
3. Give preparation and uses of PAN.
4. Differentiate isotactic and syndiotactic polymers.
5. What is the significance of poly dispersity index ?
6. Distinguish natural and synthetic polymers.
7. What is SBR ? Write its uses.
8. Write down the steps involved in free radical polymerisation.
9. Write down the synthesis and one use of poly urethane.
10. What is step growth polymerization ?
11. Give the preparation of urea formaldehyde resins.
12. Define viscosity average molecular mass.

(8 × 3 = 24 marks)

Turn over

Section B (Paragraph)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain classification of polymers based on intermolecular forces
14. Write a short note on LDPE and HDPE.
15. Write a short note on conducting polymers.
16. Explain number average and weight average molecular weights.
17. Explain briefly thermal degradation process.
18. Give the preparation and uses of any *two* synthetic rubbers.
19. Explain briefly Zeigler- Natta polymerization.

(5 × 5 = 25 marks)

Section C (Essay)

Answer any one question.

The question carries 11 marks.

20. Explain briefly : (i) Bulk polymerization ; (ii) Solution polymerization ; (iii) Suspension polymerization ; and (iv) Emulsion polymerization
21. Explain cationic and anionic polymerizations with mechanisms.

(1 × 11 = 11 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
MARCH 2022**

Polymer Chemistry

PC 6B 02 (E1)—POLYMER PROCESSING AND TECHNOLOGY

(2014—2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer all questions.

Each question carries 1 mark.

1. What is TMA ?
2. Which acid is used in rubber processing ?
3. Give the name of trans form of NR.
4. What is the raw material of rayon ?
5. What is Teflon ?
6. Which is the first synthetic polymer ?
7. Which polymer is used in thermocol for packing ?
8. What is meant by ASTM ?
9. Give an example for thermosetting polymer.
10. What is UF ?

(10 × 1 = 10 marks)

Part B

Answer any ten questions.

Each question carries 2 marks.

11. What is meant by calendaring ?
12. How will you prepare RSS ?
13. What is meant by extenders ?
14. What are plastimeters ?

Turn over

15. What is density kit ?
16. Write on abrasion resistance.
17. What is milling ?
18. Explain compounding.
19. Distinguish between elastomers and fibres.
20. What is MFI ?
21. How will you prepare vulcanized rubber ?
22. What is meant by latex preservation ?

(10 × 2 = 20 marks)

Part C

Answer any five questions.

Each question carries 6 marks.

23. Explain injection moulding with diagram.
24. Discuss tensile property determinations.
25. How will you test elastic properties?
26. Differentiate between ASTM, BIS, BS and ISO.
27. Discuss the physical testing of rubber.
28. Write short notes on antioxidants and accelerators.
29. Explain thermoforming.
30. Explain extrusion with diagram.

(5 × 6 = 30 marks)

Part D

Answer any two questions.

Each question carries 10 marks.

31. Discuss stress strain properties, creep behaviour and friction properties
32. Discuss the applications of polymers based on their physical properties.
33. Compare and contrast compression moulding, injection moulding and transfer moulding.
34. Write short notes on mastication, milling and calendaring.

(2 × 10 = 20 marks)

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, MARCH 2022

Polymer Chemistry

PC 6B 01—POLYMER CHEMISTRY—I

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

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

1. Give an example for addition polymer.
2. What are thermoplastics ?
3. Give the structure of teflon.
4. Write any *two* uses of butyl rubber.
5. What is PVP ?
6. What are the monomers of nomex ?
7. Give *two* examples for cross linked polymers.
8. What is saran ?
9. Give the chemical name of superglue.
10. Give any *two* uses of polystyrene.

(10 × 1 = 10 marks)

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

11. Give the preparation and uses of PAN.
12. What is condensation polymerisation ?

13. Define Tacticity.
14. What is vulcanization ?
15. What is SBR ? What are its uses ?
16. Distinguish homo and hetero polymers.
17. What is dynel ? What are its uses ?
18. What is meant by degree of polymerisation ?
19. Write any *two* uses of poly urethanes.
20. What do you mean by thermal degradation of polymers ?
21. Give the synthesis of PVC.
22. What are the various steps involved in free radical polymerization ?

(10 × 2 = 20 marks)

Section C

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

23. Explain oxidative and biodegradation of polymers.
24. Discuss the classification of polymers based on intermolecular forces.
25. Write a short note on LDPE and HDPE.
26. What is Zeigler- Natta polymerization ?
27. Write a short note on conducting polymers.
28. Discuss blow moulding and thermoforming process.
29. Distinguish chain growth and step growth polymerization.
30. Give the preparation and uses of melmac and urea formaldehyde resins.

(5 × 6 = 30 marks)

Section D

Answer any two questions.

Each question carries 10 marks.

31. What is glass transition temperature (T_g) ? What are the factors affecting it ?
32. Explain briefly : (a) Bulk polymerization ; (b) Solution polymerization ; (c) Suspension polymerization ; and (d) Emulsion polymerization.
33. Explain cationic and anionic polymerizations with mechanisms.
34. Write down the preparation, properties and uses of : (a) PMMA ; (b) Phenol formaldehyde resins ; (c) Silicone rubber ; and (d) Neoprene.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION
MARCH 2021**

Polymer Chemistry

PC 6B 02 (E1)—POLYMER PROCESSING AND TECHNOLOGY

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all questions.

Each question carries 1 mark.

1. What is collodion ?
2. Give the IUPAC name of isoprene.
3. Expand BIS.
4. Name a plasticizer for PVC.
5. Which technique is used for moulding hollow bottles ?
6. Name any one test for determining hardness of a material.
7. Who introduced vulcanization ?
8. Give an example for a semi synthetic polymer.
9. What is curing ?
10. Which process is used for producing spongy materials ?

(10 × 1 = 10 marks)

Section B

Answer at least five questions.

Each question carries 4 marks.

All questions can be attended.

Overall Ceiling 20.

11. What are the conditions for obtaining reasonably good stress strain curve ?
12. What do you mean by fatigue of a polymer ?

Turn over

13. Discuss the advantages of mercerized cotton.
14. What is reclaimed rubber ?
15. Explain the term latex spreading.
16. What is the advantage of Ubbelohde Suspended Level Viscometer over Ostwald Viscometer ?
17. What is Gutta Percha ?
18. Write any two applications of carboxy methyl cellulose.
19. Discuss the advantages of transfer moulding over compression moulding.
20. Write a note on latex concentration.
21. How is marblisation effect achieved during calendaring ?
22. Give examples of organic and inorganic colorants used in plastic industry.

(5 × 4 = 20 marks)

Section C

*Answer at least **four** questions.*

Each question carries 7 marks.

All questions can be attended.

Overall Ceiling 28.

23. Discuss impact tests in polymers.
24. With a neat sketch discuss blow moulding of plastics.
25. How is rayon manufactured ?
26. Differentiate between internal plasticization and external plasticization.
27. Explain the working of a two roll mill.
28. Discuss the different forms of dry rubber.
29. Write a note on ISO 899-1 method for determining the creep behavior of plastics
30. Briefly describe the three zones in an extruder screw.

(4 × 7 = 28 marks)

Section D

*Answer any two questions.
Each question carries 11 marks.*

31. Discuss the working of Banbury internal mixer in rubber processing.
32. Explain :
 - (a) Thermofoaming.
 - (b) Rotational moulding.
33. Discuss with suitable examples the various ingredients in latex compounding.
34. Explain the important test methods for measuring the physical properties of polymers.

(2 × 11 = 22 marks)

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