

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Fifth Semester

Chemistry

Major Elective — POLYMER CHEMISTRY

(For those who joined in July 2021 – 2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Find the thermosetting plastic from the following
(a) PVC (b) Nylon
(c) Polyethylene (d) Bakelite
- Predict the T_g value of low molecular weight polymers
(a) Low (b) High
(c) Very high (d) Zero

- An example for condensation polymer is
(a) PVC (b) Terylene
(c) Polypropylene (d) Polystyrene
- Suspension polymerisation method is employed for the commercial production of
(a) Poly styrene (b) PVC
(c) Polyacrylonitrile (d) All the above
- What is bakelite?
(a) Phenol-formaldehyde resin
(b) Melamine-formaldehyde resin
(c) Urea-formaldehyde resin
(d) Epoxide-bisphenol resin
- Which of the following is a high molecular weight of isoprene units?
(a) PVC (b) Natural rubber
(c) Teflon (d) Nylon 6, 6
- Which of the following is an example for hydrolysis of polymers?
(a) Oxidative degradation
(b) Random degradation
(c) Mechanical decomposition
(d) Thermal degradation

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- Casting is a process by which plastic articles are produced in moulds
(a) By applying pressure and temperature
(b) By applying pressure alone
(c) By applying temperature only
(d) Without applying pressure
- Which of the following polymer used in contact lens?
(a) PVC
(b) Polymethyl methacrylate
(c) Polyurethane
(d) Teflon
- The example(s) for the conducting polymer(s)
(a) Polyacetylene (b) Polyamine
(c) Polypyrrole (d) All of the above

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

- (a) Distinguish between thermoplastics and thermosetting plastics.
Or
(b) What are copolymers? Give the types of copolymers? Explain any two copolymers.
- (a) Explain the addition polymerisation and condensation polymerisation.
Or
(b) Discuss bulk polymerisation and suspension polymerisation.
- (a) How is Buna-S rubber prepared? Write down any four applications.
Or
(b) Write the preparation of Nylon 6 6 and its applications.
- (a) Discuss the basic principles of polymer processing.
Or
(b) Explain compression moulding in detail.

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15. (a) What are conducting polymers? Discuss the mechanism of electrical conduction.

Or

- (b) Point out any two conducting polymers and explain them.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) What is glass transition temperature? Discuss the factors affecting the glass transition temperature.

Or

- (b) Explain linear, branched and cross linked polymers with suitable examples.

17. (a) Explain the anionic and cationic polymerisation with suitable examples.

Or

- (b) Discuss emulsion and solution polymerisation with suitable examples.

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18. (a) Write the preparation and uses of polyvinyl chloride bakelite and polyphosphazenes.

Or

- (b) How are Teflon, polyethylene terephthalate and neoprene rubber prepared? Mention their uses.

19. (a) What is meant by polymer degradation? Describe briefly thermal mechanical and photodegradations with suitable example.

Or

- (b) Write a note on polymer compounding.

20. (a) Discuss briefly any four types of plastic waste management.

Or

- (b) What are 'biopolymers'? Discuss the polymers used in artificial heart, kidney, skin and blood cells.

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