0302E1354

Candidate's Seat No :_____

MSc Sem.-1 Examination

402

Polymer Science

Time : 2-30 Hours] **February-2025** **[Max. Marks : 70**

Question-1 write the following

(i) Classify polymers on the basis of structural unit variety and structural unit orientation. **7 Marks**

(ii) Describe the polymerization of polypropylene. State the important properties and applications of polypropylene and its copolymer. **7 Marks**

OR

(i) Describe the properties and applications of UHMWPE and XLPE. **7 Marks**

(ii) Describe preparation, properties and applications of vinyl polymers and its co-polymers. **7 Marks**

Question-2 write the following

(i) What do you mean by Engineering plastics? How the following Engineering plastics can be synthesized? **7 Marks**
(a) PC
(b) Polyacetal
(c) PPO

(ii) What are Polyurethane? How they are prepared. Explain properties and application of thermoplastic polyurethane. **7 Marks**

OR

(i) What are polyesters? How they are prepared? Differentiate between PET and PBT. **7 Marks**

(ii) What are polyamides? How they are polymerized. Give its properties and application. **7 Marks**

Question-3 write the following

(i) How aromatic polyamides are prepared? With suitable examples enlist their applications **7 Marks**

(ii) Define nanofillers and describe the role of nanofillers in polymer nanocomposites. **7 Marks**

OR

(i) What is polyimide? Write structure, properties and applications of PAI and PEI. **7 Marks**

(ii) Describe super absorbent polymers, their synthesis, properties and applications. **7 Marks**

Question-4 write the following

(i) Write a note on the preparation and properties of phenol formaldehyde resins. Differentiate between resole and novolac. **7 Marks**

(ii) Describe the role of polymers in biomedical applications. **7 Marks**

OR

(i) What are biobased polymers and their sources? Explain manufacturing, properties and applications of PHA. **7 Marks**

(ii) What are silicone polymers? Describe their synthesis, properties and applications. **7 Marks**

Question-5 write the following. (Attempt any seven out of twelve.) **14 Marks**

1. Distinguish between plastics and rubbers.
2. Give names of any two natural fibres.
3. Draw the structure of the monomer each of the following polymers-
   (a) PMMA, (b) PMA.
4. Describe the synthesis of PVDF.
5. Differentiate between PTFE and PCTFE.
6. Kevlar is aromatic polyester. (True/False)
7. Kapton is a trade name of polyimide polymer. (True/False)

(P.T.O.)

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8. Write any two ceramic based nanofillers used in polymer nanocomposites.
9. Differentiate between PE and bio-PE.
10. Draw the structure of PBAT.
11. PS is formed by the addition polymerization of ..... (monomer).
12. Pitch based material is used for the preparation of .....fiber.

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