

B.Sc. (Part-III) (CBCS Pattern) Semester-VI
CHT16 - USC DSE - Chemistry-IV : Polymer Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/24/13344

Max. Marks : 50

Notes : 1. All questions are compulsory and carry marks as indicated.

1. a) What are polymer? How they are classified in detail. Explain tacticity of polymers. 5
- b) Give relationship between functionality and degree of polymerization. 5

OR

- c) Explain, History of polymeric materials. 2½
- d) Differentiate between addition polymerization and condensation polymerization. 2½
- e) What do you mean by bifunctional and polyfunctional systems. 2½
- f) Explain molecular forces and chemical bonding in polymers. 2½
2. a) Explain the concept of initiation, propagation and termination steps in chain-growth polymerization reactions. 5
- b) Discuss the significance of flame retardant additives in polymers. How do they enhance the fire resistance of polymers and what are some commonly used flame retardants? 5

OR

- c) Compare and explain the steps involved in cationic and anionic polymerization. 2½
- d) What are fillers and Reinforcement. 2½
- e) Describe the difference between step-growth polymerization and chain-growth polymerization in terms of kinetics. 2½
- f) Explain antistatic and curing agents. 2½
3. a) Briefly describe the method for determination of molecular weight by viscometry. 5
- b) Explain Flory-Huggins theory in detail. 5

OR

- c) Explain the end group analysis method for the determination of molecular weight of polymers. 2½
- d) Write a note on lower and upper critical solution temperatures. 2½

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| e) | Explain the criteria for polymer solubility. | 2½ |
| f) | Give an account of thermodynamics of polymer solutions. | 2½ |
| 4. | a) Give preparation, properties and application of Bakelite. | 5 |
| | b) Give the method of preparation of poly vinyl chloride. Write its application in detail. | 5 |

OR

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| c) | Explain conducting polymers with examples. | 2½ |
| d) | What are Fluoro polymers. | 2½ |
| e) | Explain the properties of polystyrene. | 2½ |
| f) | Give the method of synthesis of polyamides. | 2½ |
| 5. | Solve any ten. | |
| a) | Define monomers | 1 |
| b) | Which starting material is used in the preparation of Nylon-6. | 1 |
| c) | Give examples of natural polymers. | 1 |
| d) | Explain co-ordination polymers in short. | 1 |
| e) | What are plasticizers. | 1 |
| f) | Give examples of ultraviolet stabilizers. | 1 |
| g) | What is molecular weight distribution? | 1 |
| h) | Define light scattering. | 1 |
| i) | What do you mean by entropy and enthalpy of polymer. | 1 |
| j) | Draw the structure of Novalac. | 1 |
| k) | Define acrylic polymers. | 1 |
| l) | What do you mean by copolymers. | 1 |
