

M.Sc.(Chemistry) (CBCS Pattern) Semester - III  
**PSCHT12.4 - Elective Paper-XII : Polymer Chemistry**

P. Pages : 2

Time : Three Hours



**GUG/S/23/11345**

Max. Marks : 80

- Notes : 1. All questions are compulsory having equal marks.  
2. Write chemical reaction and draw diagram wherever necessary.

1. a) Compare and contrast between addition and condensation polymerization. **8**  
b) What are polymer's? How polymers are classified. Explain with suitable examples. **8**

**OR**

- c) Explain Stereo-regular polymer with suitable example. **4**  
d) Distinguish between thermoplastic and thermosetting polymers. **4**  
e) Explain cross-linked Polymers. **4**  
f) Write a note on co-ordination polymers. **4**
2. a) Discuss the following methods for the determination of molar masses of polymers. **8**  
1) Viscometry 2) Osmometry  
b) Write down the formula for number average and mass average, molecular mass and obtain relation between them. **8**

**OR**

- c) Write in detail sedimentation velocity method to determine molecular mass. **4**  
d) Explain end-group analysis for determination of molecular mass of polymers. **4**  
e) Write a note on light scattering method for determination of molecular mass of polymer. **4**  
f) Explain phenomenon of diffusion with respect to polymer. **4**
3. a) Describe any one method to determine the crystallinity of polymer. **8**  
b) What is glass transition temperature? Explain the effect of molecular weight, branching and cross linking on glass transition temperature. **8**

**OR**

- c) Explain the relation between  $T_g$  and  $T_t$ . **4**  
d) What is degree of crystallinity? Give a method for purification of polymer. **4**  
e) Write a note on strain induced morphology of polymers. **4**

- f) Explain the terms 4
- i) Configuration of polymer chain.
  - ii) Crystal structure of polymer.
4. a) Explain in details about conducting polymers. 8
- b) Explain the synthesis and applications of following polymers 8
- i) Polyvinyl Chloride
  - ii) Polyamides

**OR**

- c) Explain synthesis and uses of polyethylene. 4
- d) Write short note on fire retarding polymers. 4
- e) Give the synthesis and application of polyesters. 4
- f) What are phenolic resins? Give it's synthesis. 4
5. a) What is branched polymerization? 2
- b) Define Elastomer. 2
- c) What is epoxy resin? 2
- d) Define molecular mass and molecular distribution of polymer. 2
- e) Write the applications of gel permeation chromatography. 2
- f) Write a note on melting of polymer. 2
- g) What are commercial polymer. 2
- h) What is the effect of chain topology on  $T_g$ . 2

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