



**M.Sc. III Semester Degree Examination, April/May - 2023**

**CHEMISTRY**

**Polymer Science and Technology  
(CBCS)**

Time : 3 Hours

Maximum Marks : 70

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**Note :** Answer **any five** of the following questions with Question No. **1 Compulsory**, each question carries **equal** marks.

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1. (a) Discuss different types of polymers with examples. **4+5+5**  
(b) What is polymerization ? Discuss condensation and addition polymerization with suitable examples.  
(c) What is vulcanization of rubber ? Discuss synthesis and applications of Butyl rubbers.
2. (a) Give practical significance of molecular weight of polymers. **4+5+5**  
(b) Discuss ultracentrifugation method for measurement of molecular weight of polymers.  
(c) Discuss hardness and abrasion resistance of polymers.
3. (a) What is chain topology ? How it effects the molecular weights of polymers. **4+5+5**  
(b) What is glass transition temperature ? Explain factors effect glass transition temperature of polymers.  
(c) Write a note on Polymer structure and physical properties.
4. (a) Discuss various 'short term techniques' of testing of polymers. **4+5+5**  
(b) Write a note on thermodynamics of polymer solution.  
(c) What is breakdown voltage in polymer testing ? Write a note on heat distortion temperature.



5. (a) Differentiate between plastic and fibers. Write a note on foaming reinforcing of polymer processing. **4+5+5**
- (b) Discuss the role of functional polymers in dentistry and blood cells.
- (c) Discuss commercial applications of HDPE and LDPE.
6. (a) Comment on solubility of polymers. **4+5+5**
- (b) Discuss Fatigue, impact and tear resistance of polymers.
- (c) Discuss the relationship between  $T_m$  and  $T_g$  of crystalline polymers.
7. (a) Explain long term testing of polymers. **4+5+5**
- (b) Write a note on :
- (i) Epoxy resins
- (ii) Silicon polymers
- (c) Discuss Flouy-Huggins theory of polymeric solutions.
8. (a) Explain Osmotic pressure method for measurement of molecular weight of polymers. **4+5+5**
- (b) What is Glass transition temperature ? Discuss effect of branching and cross linking on  $T_g$  in crystalline polymers.
- (c) Discuss Die casting and rotational casting of polymer processing techniques.

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