6. (a) Write short notes on the following molecular weight determination methods : **15**

(i) Light Scattering

(ii) MALDI.

(b) Define glass transition temperature and discuss on which factor glass transition temperature depends. What thermal instrumental technique would you use to determine T_g ? **5**

Unit IV

7. What are conducting polymers ? Discuss their properties and factor affecting the conductivity of conducting polymers. Discuss the doping of polymers and its significance. **20**

8. Write short notes on the following polymer processing : **20**

(a) Injection molding

(b) Blow molding and calendering.

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CC-295

M. Sc. EXAMINATION, Dec. 2017

(Third Semester)

(Main & Re-appear)

CHEMISTRY

CH-653-B

Organic Chemistry Elective-I

(Polymer Chemistry)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss the chain structures obtained in alternating, random, block and graft copolymers. **8**

(b) Explain ionic chain polymerisation (cationic and anionic) in detail. **12**

2. (a) What is Ziegler Natta catalyst and discuss the mechanism of coordination polymerization in which they are used. **5**

(b) Explain role of initiators and terminators in Free radical chain polymerisation. **5**

(c) Discuss ring opening polymerization with example. **5**

(d) How will you differentiate the term Termination and Inhibition ? **5**

Unit II

3. What is critical micelle concentration ? Describe the technique of emulsion polymerisation. What are the advantages of this technique over suspension polymerisation ? **20**

4. (a) Discuss the molecular weight distribution ? List in increasing values : **5**

Mn, Mv, Mw and Mz

(b) Write short notes on the following : **15**

(i) Solution polymerization

(ii) Bulk polymerization

(iii) Polydispersity and degree of polymerization.

Unit III

5. (a) Discuss the changes in IR spectra in polymerizing MMA to PMMA ? Discuss *two* methods to check whether PMMA is contaminated with monomer MMA ? **8**

(b) The structure of $C_6H_8O_4$ from the ^1H NMR data given below : **5**

^1H NMR : δ 4.98 (*q*, 2H, J = 8Hz), 1.52 (*d*, 6H, J = 8 Hz) ppm.

(c) How will you determine the molecular weight of a polymer via viscosity method ? **7**