NCE-003-010203 Seat No. _____

M. Sc. (Sem. II) (CBCS) Examination

April / May - 2017

C-203 : Chemistry

(Macromolecular Physical Chemistry - I)

(Old Course)

Faculty Code : 003

Subject Code : 010203

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.

(2) All questions carry equal marks.

1 Answer the following : (any **seven**)

(a) Define: Telomerization, Oligomers, Inhibitor, Cohesive energy density.

(b) What is functionality? Give one example each of bi, tri and tetra functional compounds.

(c) Give an account of thermoplastics and thermosets with suitable examples.

(d) What is step-wise polymerization? Give at least three examples.

(e) Distinguish between Syndiotactic and Atactic polymers.

(f) Explain the effect of activator concentration on the rate of ring scission polymerization and molecular weight of the polymer.

(g) Give Hildebrand and Flory equations for solubility parameters and write the significance of terms involved in these equations.

(h) Discuss vulcanization of rubbers.

(i) What are initiators? Give the decomposition reactions of two initiators.

(j) Give the repeat unit structure and full forms of PS, PMMA, PET and Teflon.

2 Write notes on : (any **three**)

(a) Coordination polymerization.

(b) Polymer dissolution and solubility parameter.

(c) Effect of monomer concentration and temperature on polycondensation reactions.

(d) Methods of initiating free radical polymerization.

3 Answer the following : (any **two**)

(a) Answer the following :

(i) Explain Fineman - Ross method for the determination of reactivity ratios.

(ii) Describe chemical degradation of different types with suitable examples.

(b) Derive the Flory-Mayo relation for chain transfer reaction.

OR

(a) Discuss the statistics of linear polycondensation.

(b) Discuss the reactivity ratios and copolymerization behavior.

4 Answer the following : (any **three**)

(a) Explain curing reactions of phenol-formaldehye and epoxy resins.

(b) Discuss the factors affecting free radical polymerization and molecular weight of the resultant polymer.

(c) Give an account of non-linear polycondensation reaction.

(d) Discuss types of solutions in detail.

5 Answer the following : (any **two**)

(a) Discuss polycondensation equilibrium and molecular weight of polymer.

(b) Explain thermodynamics of simple liquid mixtures in detail.

(c) Discuss the kinetics and mechanism of ring scission polymerization.

(d) Enlist the catalysts used in cationic and anionic polymerization and discuss the kinetics of any one of them.