DII-003-010203 Seat No. _____

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

May / June – 2015

Macromolecular Physical Cehmistry - I

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.

Q1. Answer the following (Any seven):

(a) Define: Telomerization, Thermoplastics, Copolymer, chain length.
(b) What is the effect of activator concentration on rate of ring scission polymerization and molecular weight of the polymer.
(c) Give the full forms and repeat unit structures of: CA, PMMA, PVC and Teflon.
(d) Explain the term functionality. Discuss different functionality of same compound under different conditions.
(e) Differentiate between symdiotactic and atactic polymers.
(f) Write the decomposition reactions of azo bisisobutyronitrile and t-butyl hydro peroxide.
(g) Explain curing of epoxy resins and phenol-formaldehyde resins.
(h) What is step-wise polymerization? Explain with suitable examples.
(i) Explain melt polycondensation.
(j) Discuss Flory's approach of solubility parameter.

Q2. Write notes on (Any three):

(a) Emulsion polymerization.
(b) Factors affecting the rate of polycondensation and molecular weight of the polymer.
(c) Coordination polymerization.
(d) Ring scission polymerization of ethylene oxide.

Q3. Answer the following:

(a) Show that the rate of free radical polymerization is first order with respect to monomer concentration and half order with respect to initiator concentration.
(b) Explain thermodynamics of simple liquid mixtures in detail.

OR

(a) Discuss polycondensation equilibrium and molecular weight of polymer.
(b) Explain reactivity ratios and copolymerization behavior.

Q4. Answer the following (Any three):

(a) Describe the effect of temperature and monomer concentration on Ring ↔Polymer equilibrium.
(b) Give an account of addition and substitution reactions in polymers.
(c) Explain statistics of linear polycondensation.
(d) Discuss in detail the factors affecting free radical polymerization and properties of resulting polymers.

Q5. Answer the following (Any three):

(a) Discuss (i) Carother's equation in polycondensation and (ii) Polyrecombination reactions.

(e) State the different methods for the determination of reactivity ratios. Describe Fineman Ross method in detail.

(b) What is ionic polymerization? Discuss the kinetics of anionic polymerization in detail.

(c) Give an account of different types of polymer solutions.
