Roll No. .....

Total No. of Questions : **9**] [Total No. of Printed Pages : **4**

(2033)

UG (CBCS) IIIrd Year Annual Examination

3291

B.Sc. CHEMISTRY

(Polymer Chemistry)

(DSE-2B)

Paper : CHEM 305 TH

Time : 3 Hours] **[Maximum Marks : 50**

Note :– Attempt *five* questions in all, selecting *one* question each from Sections A, B, C and D. Section E is compulsory.

Section–A

1. (a) Give an account of classification of polymers on the basis of intermolecular forces.

   (b) How do homopolymers differ from copolymers ? Explain with examples.

   (c) Define functionality of a monomer. What is its importance ? 4,3,3

2. (a) Define the term tacticity. Discuss atactic and isotactic polymers in detail.

(b) Differentiate between addition and condensation polymerisation.

(c) Calculate the extent of reaction when phthalic anhydride and glycerol react in the molar ratio of 1.5 and 1.2. 4,3,3

Section–B

3. (a) Explain the kinetics of an anionic polymerization. Why is it known as living polymerization ?

(b) What is kinetic change length and degree of polymerization ? How are the two related to each other ?

(c) What is micelle and critical micelle concentration ? 4,4,2

4. (a) Define glass transition temperature (T_g) ? How is it related to T_m for symmetrical and unsymmetrical polymers ?

(b) Explain in detail the factors affecting the degree of crystallinity.

(c) Write a note on Fringed-micelle model of crystalline polymers. 3,4,3

Section–C

5. (a) Explain light scattering method to determine the molecular weight of polymers. What are the advantages of this method ?

   (b) What is the polydispersity index ? Explain its significance.

   (c) What is number average molecular weight of a polymer ? How is it calculated ? 4,3,3

6. (a) Define solubility parameter. How does the Crystallinity and flexibility of the polymer chain affect the solubility of a polymer ?

   (b) Define an expression for enthalpy of mixing for a polymer solution.

   (c) Draw the phase diagram of a binary polymeric system with UCST. 4,4,2

Section–D

7. (a) What do you mean by thermal degradation ? Explain the factors affecting thermal degradation.

   (b) Explain Hooke's law and Newton's law of viscoelasticity.

   (c) What are Pseudoplastics ? 4,4,2

8. (a) What is Burra-S ? How does it differ from Buna-N ? Explain properties and uses of both.

(b) Give the preparation and uses of :

(i) Novalac

(ii) Nylon-6

(iii) PMMA 4,6

Section–E

9. (a) What is the basic difference between thermoplastic and thermosetting polymer ?

(b) Give the formula of degree of crystallinity in terms of enthalpy.

(c) How is PTFE prepared ? Give its uses.

(d) Fill in the blanks :

(i) When melting occurs, the change in free energy of the process is ..... .

(ii) At the gel point, the degree of polymerisation becomes ..... .

(e) True *or* False :

(i) The polymers with aromatic rings in the main chain are resistant to hydrolysis.

(ii) Coordination polymerisation is homogenous in nature.

2×5=10