

Roll No.

Total No. of Questions : 9]
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UG (CBCS) IIIrd Year Annual Examination
2992

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) Explain the classification of polymers on the basis of the mode of polymerization.
- (b) Differentiate crystalline and amorphous polymers.
- (c) Explain the mechanism of Cationic polymerization.

3,3,4

CH–292

(1)

Turn Over

2. (a) Define the tacticity. Discuss isotactic and syndiotactic polymers with structures.
- (b) Discuss various types of molecular forces in the polymers.
- (c) Derive Carothers' equation. Give its importance. 3,3,4

Section-B

3. (a) Explain the Kinetics of free radical polymerization.
- (b) Explain emulsion polymerization. What are its advantages ?
- (c) Discuss auto-acceleration or gel effect in bulk polymerization. 4,4,2
4. (a) Define degree of crystallinity and discuss the factors affecting the degree of crystallinity.
- (b) Explain the effects of side groups on polymer properties.
- (c) Briefly explain spherulites form of polymer crystals. 4,4,2

Section-C

5. (a) Explain osmotic pressure method used for determining molecular weight of polymers.
- (b) Derive William-Landel-Ferry equation.
- (c) Define polydispersity index and also give its significance. 4,4,2
6. (a) Discuss the various factors affecting the solubility of a polymer.
- (b) Derive an expression for entropy of mixing for a polymer solution.
- (c) Draw the phase diagram for a binary polymer solution with LCST. 4,4,2

Section-D

7. Discuss the following :
- (i) Fatigue resistance
- (ii) Hardness and abrasion
- (iii) Newtonian liquids
- (iv) Non-Newtonian liquids
- (v) Young's modulus 2×5=10



8. Give the preparation and uses of the following :

(i) Conducting polymers (Polyaniline)

(ii) PAN

(iii) PMMA

(iv) BUNA-S

2.5×4=10

Section-E

9. (a) What is the difference between natural rubber and synthetic rubber ?

(b) What is Zeigler-Natta Catalyst ?

(c) Define Tg and give its relation with Tm.

(d) Write True or False :

(i) Ice is a polymer

(ii) Novalacs are urea-formaldehyde resins.

(e) Fill in the blanks :

(i) HDPE is prepared by polymerization.

(ii) Initiators used in anionic polymerization are

2×5=10

+