



**DBY-003-1102003**

Seat No. \_\_\_\_\_

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

**July - 2022**

**C-203 : Physical Chemistry**

**(Macromolecular Physical Chemistry)**

**(New Course)**

**Faculty Code : 003**

**Subject Code : 1102009**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.  
(2) All questions carry equal marks 14  
(3) Total 5 questions.

**1 Answer the following (any seven). 14**

- (1) What is degradation? Give the classification of degradation.
- (2) Define : Gel point, polymer, regulator, chain polymerization.
- (3) Give the repeat unitstructure.
  - (i) PS
  - (ii) Natural Rubber
  - (iii) Cellulose
  - (iv) PVA
- (4) Explain non-linear polycondensation.
- (5) Discuss cyclization reaction.
- (6) Explain Gradient elution method.
- (7) Discuss cross linking.

- (8) Give the name of the methods of initiating free radical polymerization. Explain any one.
- (9) Explain the formation of polyurea by stepwise polymerization and why its rate is higher than polyurethane.
- (10) What is the effect of temperature on the rate of ring-scission polymerization and molecular weight of the polymers.

**2 Answer the following. (any two) 14**

- (1) Discuss thermodynamics of ring transformation to linear polymer.
- (2) What are the factors affecting free radical polymerization and properties of resulting polymer.
- (3) Describe gel permeation chromatography.

**3 Answer the following. 14**

- (1) Discuss chemical degradation in detail.
- (2) Explain :
  - (i) Polyrecombination with examples.
  - (ii) Bulk polymerization.

**OR**

**3 Answer the following. 14**

- (1) Discuss any two methods of polycondensation.
- (2) Discuss addition and substitution reactions.

**4 Answer the following. 14**

- (1) Discuss molecular weight control in polycondensation.
- (2) Explain :
  - (i) Co-ordination polymerization.
  - (ii) Partial dissolution method.

5 Answer the following. (any two)

14

- (1) Discuss the statistics of linear polycondensation.
  - (2) Differentiate between :
    - (i) Thermoplastic and Thermosetting.
    - (ii) Syndiotactic polymer and Atactic polymers.
    - (iii) Homopolymers and Heteropolymers.
  - (3) Emulsion polymerization.
  - (4) Discuss thermal effect with rupture of main chain in physical degradation.
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