



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

**HP-003-1102003**

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

**April – 2023**

**Physical Chemistry : C-203**

*(Macromolecular Physical Chemistry)*

*(New Course)*

**Faculty Code : 003**

**Subject Code : 1102003**

Time :  $2\frac{1}{2}$  Hours / Total Marks : 70

**Instructions :**

- (1) All questions are compulsory.
- (2) Total five questions.
- (3) Each question carry equal marks.

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

- (a) Differentiate between :  
Thermoplastics and Thermosetting.
- (b) Discuss non linear polycondensation.
- (c) What is functionality ? Give one example of bi, tri, and tetra functional group.
- (d) Discuss cross linking.
- (e) Explain the formation of poly urea by stepwise polymerization.
- (f) State the methods of initiating free radical polymerization. Explain any one.
- (g) Discuss partial dissolution method.
- (h) What is the effect of concentration on rate of ring scission polymerization.
- (i) What is degradation ? Give the classification of degradation.
- (j) Give the full forms and repeat unit structure of :
  - (i) PMMA
  - (ii) NR
  - (iii) Starch
  - (iv) PS

- 2** Answer the following : (any **two**) **14**
- (a) Discuss any two methods of polycondensation.
  - (b) Describe kinetics and mechanism of ring scission polymerization.
  - (c) Which factors are affecting free radical polymerization and properties of resulting polymer.
- 3** Answer following : **14**
- (a) Discuss kinetics of chain polymerization.
  - (b) Discuss chemical degradation in detail.
- OR**
- (a) Discuss statistics of linear polycondensation.
  - (b) Explain thermodynamics of ring transformation to linear polymer.
- 4** Answer the following : **14**
- (a) Discuss molecular weight control methods by polycondensation.
  - (b) Describe Gel permeation chromatography method in detail.
- 5** Answer the following : (any **two**) **14**
- (a) Write notes on :
    - (i) Stereo regular polymerization.
    - (ii) Gradient elution method.
  - (b) Describe Emulsion polymerization.
  - (c) What is thermal effect ? Discuss the reaction proceeding with rupture of main chain.
  - (d) Which factors are affecting the rate of polycondensation and molecular weight of polymer.
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