



**PAS-003-010203**

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

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

**August/September – 2020**

**Physical Chemistry**

*Macromolecular Physical Chemistry-I*

*(Old Course)*

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

[Total Marks : 70

**Instructions :**

- (1) All questions are compulsory.
- (3) Each question carry 14 marks.

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

- (a) Define : Regulator, copolymer, solubility parameter, telomerization.
- (b) Write the full form and structure
  - (i) PMMA
  - (ii) Teflon
  - (iii) Starch
  - (iv) PVA
- (c) Give an account of tacticity in polymer.
- (d) Explain cross-linking.
- (e) What is functionality ? Give two examples of all types functionalities.
- (f) What is the difference between chain and stepwise polymerization ?
- (g) Explain bulk polymerization.
- (h) Discuss non-linear polycondensation.
- (i) Explain polymer cyclization reaction.
- (j) What is the effect of temperature on ring scission polymerization ?

- 2 Write notes on :
- (a) Discuss the reaction without rupture of main chain in thermal effect.
  - (b) Discuss common initiators with suitable example.
  - (c) Effect of temperature and monomer concentration on polycondensation.
  - (d) State types of polymer solution and give an account of solution with  $S_E < 0$ .

- 3 Answer the following :
- (a) Discuss kinetics of chain transfer reaction.
  - (b) Discuss addition and substitution reaction.

**OR**

- 3 (a) Discuss entropy of mixing.  
(b) Discuss thermodynamics of ring transfer to linear polymer.

- 4 Answer the following : (any **three**)
- (a) Discuss types of solution in detail.
  - (b) Discuss molecular weight control in polycondensation.
  - (c) Discuss polyrecombination in detail.
  - (d) Explain melt and solid phase polycondensation.

- 5 Answer the following : (any **two**)
- (a) Explain kinetics and mechanism of ring scission polymerization.
  - (b) Explain :
    - (i) Solution polymerization
    - (ii) Emulsion polymerization
  - (c) Explain reactivity ratio and copolymerization behaviour.
  - (d) Discuss degradation reaction.