

**U.G. 5th Semester Examination-2021**

**CHEMISTRY**

[HONOURS]

**Discipline Specific Elective (DSE)**

**Course Code : CHEM-H-DSE-T-1A**

**(Polymer Chemistry)**

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

1. Write short notes on the following (any **five**):

2×5=10

- a) Types of Copolymer
- b) Functionality
- c) Thermoplastic and thermosetting polymers
- d) Lower and upper critical solution temperature
- e) Plasticizers
- f) Molecular weight distribution curve
- g) Degree of polymerization
- h) Chain transfer agent

2. Answer any **two** questions :

5×2=10

- a) Explain Ring-opening polymerization.

- b) Write 5 Differences between Amorphous and Crystalline Polymers.
- c) Write 5 key Applications of polymer in daily life considering 5 different polymers.
- d) Write at least 5 Differences between addition and condensation polymerization.
- e) In a polymer, there are 100 molecules of M. Wt. 15000, 200 molecules of M. Wt. 20000 and 300 molecules of M. Wt. 6000. Calculate  $M_n$ ,  $M_w$ , and PDI for this mixture.

3. Answer any **two** questions:

10×2=20

- a) Describe various polymerization processes and explain how one substrate can give different polymers by varying degrees of polymerization.
- b) Explain the kinetics of step-growth and coordination polymerization.
- c) Define glass transition temperature. What are the factors affecting Tg? How is Tg related to the molecular weight of polymers?
- d) Illustrate Flory–Huggins theory and its significance.
- e) Write down the preparation, structure, and applications of polyvinyl acetate, polyamides, and Novalac.

[Turn over]