

M.Sc.(Chem.) Semester - 2 (CBCS) Examination**August/September -2020 [OLD COURSE]****PHYSICAL CHEMISTRY (CORE)****Time: 2:00 Hours****Marks: 56****Instructions:**

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any four of the following questions.

Que-1 Answer any seven of the following ten questions. (14)

1. Give two examples each of bi, tri and tetra functional compound.
2. What is step-wise polymerization? Give three examples.
3. Calculate X_n of nylon 66 with a molecular weight of 27138.
4. Give the full form and write the repeat units of the following. PS, PMMA, Strach and Teflon.
5. Explain interfacial polycondensation method.
6. Discuss the effect of monomer concentration on direction of polycondensation reaction.
7. Explain curing reaction.
8. Differentiate: Atactic, Syndiotactic and Heteroptactic.
9. Discuss the reaction route of poly functional compound.
10. Explain mechanism of initiated polymerisation.

Que-2 Answer the following (Answer any three) (14)

1. Explain polymer fractionation by Gel Permeation Chromatography method.
2. Describe kinetics of chain transfer reaction.
3. A laboratory preparation of 610 nylon was made with 0.2 mole % acetic acid (based on carboxyl groups) as a viscosity stabilizer. The reaction was carried to completion. Calculate M_n and M_w .
4. Discuss polycondensation equilibrium and molecular weight of polymer.

Que-3 Answer the following questions. (14)

1. Describe statistical of linear polycondensation.
2. Discuss the kinetics and mechanism of Ring scission polymerization and also discuss effect of activator concentration and temperature on rate of ring scission polymerization and molecular weight of resulting polymer

OR

Que.3 Answer the following questions.

1. Explain the Partial dissolution and fractional precipitation method.
2. Explain Co-polymerisation and its kinetics.

Que.4 Answer the following questions. (Any three) (14)

1. Describe the evolution of reactive rations by Fineman-Ross methods.
2. Explain anionic polymerization and its kinetics.
3. Explain the reaction of various functional groups.
4. Explain factors affection free radical polymerization.

Que-5 Answer any two of the following four questions. (14)

1. Write a note on
 - a) Co – ordination polymeisation
 - b) Molecular weight control in polycondensation
2. (a). Explain Melt and solid phase methods of polycondensation.
(b) In an experiment, kinetic chain length in presence (V_{tr}) and in absence (V_i) are evaluated at 60°C for vinyl acetate undergoing chain transfer with dimethyl ketone solvent. V_{tr} is 93 and V_t is 6670. The ratio of $[S]/[M]$ is 0.583. Calculate the chain transfer constant for this reaction.
3. Explain:
 - a. Describe the emulsion polymerization in detail.
 - b. Explain degradation and its classification.
4. Differentiate between
 - a. Thermo casts and thermosets.
 - b. Chain polymerisation and condensation polymerisation
