

M.Sc.(Chem.) Semester - 2 (CBCS) Examination**May/June-2022 (OLD COURSE)****PHYSICAL CHEMISTRY(CORE)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 Answer any seven of the following ten questions.**[14]**

1. Define the term: telomerisation and oligomers.
2. Give the full form and write the repeat units of the following.
PET, Teflon and PS.
3. Give examples of bi, tri and tetra functional compounds.
4. Discuss the chain transfer on free radical polymerization.
5. Explain: Thermoplastic and Thermosetting polymer
6. Discuss vulcanization of rubbers.
7. Explain non-linear polycondensation.
8. Explain gradient elution technique.
9. Discuss the reaction route of poly-functional compound.
10. What is step-wise polymerisation? Explain with at least three examples.

Q.2 Answer the following (Answer any three)**[14]**

1. Explain cationic polymerization and its kinetics.
2. Describe kinetics of free radical polymerization.
3. Discuss about cross-linking polymers.
4. In an experiment, kinetic chain length in presence (v_{tr}) and in absence (v_i) are evaluated at 55° C for vinyl acetate undergoing chain transfer with dimethyl ketone solvent. v_{tr} is 92.3 and v_i is 6742. The ratio of $[S]/[M]$ is 0.580. Calculate the chain transfer constant for this reaction.

Q.3 Answer the following questions.**[14]**

1. Explain statistical of linear polycondensation.
2. Explain the evaluation of reactivity ratios.

OR**Q.3 Answer the following questions.**

1. Give in the brief importance of polymers.
2. Explain:
(a). Stereo regular polymers.
(b). Functionality and polymerization concept.

Q.4 Answer the following questions. (Any three)**[14]**

1. Explain polymer fractionation by partial dissolution method.
2. Explain the reaction of various functional groups.
3. Explain factors affecting free radical polymerization.
4. Explain effect of monomer concentration and temperature on direction of polycondensation reaction.

Q.5 Answer any two of the following four questions.**[14]**

1. Explain kinetics of chain transfer reaction and stepwise polymerization.
2. Write a note on
 - a) Co-ordination polymerisation
 - b) Kinetics of copolymerisation.
3. Explain:
 - a) Kinetics of ring scission polymerization.
 - b) Thermodynamics of ring transformation to a linear polymer.
4. (a). Explain the methods of polycondensation.
(b). A polyester made with equimolar glycol and a dibasic acid is to be stabilized by methanol to obtain $\bar{D}_n = 160$. Calculate amount of methanol to be added.
