

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
May/June-2022 (NEW 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 (a) Answer the following** **04**
- (1) What is functionality? Give two examples of bi and tri-functional compounds.
 - (2) Give the full form and repeat unit structure of PMMA, PAN and Nylon-66.
- Q.1 (b) Answer any two questions out of three.** **10**
- (1) Distinguish between
 - i. Syndiotactic and Atactic polymers.
 - ii. Thermoplasts and Thermosets with suitable example
 - (2) Explain Cross linking reaction.
 - (3) Write a short note on
 - i. Addition and substitution reactions
 - ii. Miscellaneous reaction.
- Q.2 (a) Answer the following** **04**
- (1) Discuss the factors affecting free radical polymerization and properties of the resulting polymer
 - (2) Explain thermal and photochemical methods for initiating free radical polymerization
- Q.2 (b) Answer any two questions out of three.** **10**
- (1) Discuss the kinetics of chain transfer reaction.
 - (2) Discuss co-polymerisation and its kinetics.
 - (3) Explain :
 - i. Cationic polymerisation.
 - ii. Co-ordination polymerisation
- Q.3 (a) Answer the following** **04**
- (1) Explain Non linear polycondensation.
 - (2) Discuss the factors affecting the rate of polycondensation and molecular weight of the polymer.
- Q.3 (b) Answer any two questions out of three.** **10**
- (1) Explain the kinetics of polycondensation reaction.
 - (2) Write a note on
 - i. Polycondensation equilibrium and molecular weight of polymer
 - ii. Molecular weight control in polycondensation
 - (3) Statistics of linear polycondensation.
- Q.4 (a) Answer the following** **04**
- Give the brief explanation about Zeta potential
- Q.4 (b) Answer any two questions out of three.** **10**
- (1) Give the difference between lyophobic and lyophilic sols.
 - (2) Write a note on
 - i. Surface active agent.
 - ii. Micellisation
 - (3) Explain Langmuir adsorption isotherm.
- Q.5 (a) Answer the following** **04**
- Explain Lead Accumulator
- Q.5 (b) Answer any two questions out of three.** **10**
- (1) Write a note on
 - i. Decomposition potential.
 - ii. Classification of electrochemical cell
 - (2) Give a brief explanation about over potential.
 - (3)
 - i. Concentration cell with transference
 - ii. Calculate the LJP with following cell,
 $\text{Ag} / \text{AgCl}_{(s)} / \text{KCl}_{m_1=1.001, r_2=0.809} / \text{KCl}_{m_1=0.049, r_2=0.830} / \text{AgCl} / \text{Ag}$
 at 25°C the transport no. of K^+ ion in KCl may be taken as 0.831.
