



Reg. No.:

Name:

University of Kerala

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

POLYMER CHEMISTRY

UK1DSCPOC101 - FUNDAMENTALS OF CHEMISTRY-I

Academic Level: 100-199

2025-Admission onwards

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	What is the branch of chemistry that deals with carbon compounds?	RE	1
2	Equivalent weight and molecular weight related as.....	RE	4
3	What happens to the solubility of a salt when its solubility product (K_{sp}) value is very small? Explain	UN	4
4	Atomic size generally _____ down a group.	UN	3
5	why are carbon nanotubes considered important in modern technology	UN	1
6	A wave function is said to be normalised if the total probability of finding the electron is equal to _____.	UN	2

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the photoelectric effect and it's significance in understanding the nature of light.	UN	2
8	Why is Marie Curie's work considered pioneering in the field of radioactivity?	UN	1
9	Compute the oxidation states possible for a transition metal like Mn or Cr using electronic configuration	AP	3
10	Differentiate between acid-base and redox titrations.	AP	4

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	<p>A)</p> <p>Calculate the total number of electrons , orbitals , and sub shell in the $n=4$ shell. Illustrate how the $(n+1)$ rule helps in predicting their filling order up to 4d orbitals.</p> <p>OR</p> <p>B)</p> <p>Modify the electron configuration of Cr , Cu and Mn to show their exceptional arrangement. Apply orbital stability rules to explain these anomalies</p>	AP	3, 3
12	<p>A)</p> <p>Illustrate photo electric effect with suitable diagram</p> <p>OR</p> <p>B)</p> <p>Analyse how Schrödinger's wave mechanical model accounts for the atomic spectra of the hydrogen atom. Discuss the limitations of Bohr's model in explaining these spectra.</p>	AN	2, 2
13	<p>A)</p> <p>Evaluate the usefulness of the periodic table as a predictive model for discovering new elements even today.</p> <p>OR</p> <p>B)</p> <p>Justify the statement: "Nanoscience has revolutionized modern electronics." Support with examples.</p>	EV	1, 1
14	<p>A)</p> <p>Devise an experiment to determine the hardness of water using EDTA titration, and explain how you could check the accuracy of your result using an acid–base titration.</p> <p>OR</p> <p>B)</p> <p>Create a detailed experimental procedure for performing an acid–base titration to determine the concentration of an unknown acid using a suitable indicator.</p>	CR	4, 4