Reg. No.: .....

Name: .....

University of Kerala

U8839

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

CHEMISTRY

UK2DSCCHE101 - FUNDAMENTALS OF CHEMISTRY II

Academic Level: 100-199

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 formula for most probable velocity?	RE	1
2	Nickel can be purified by----------process.	RE	4
3	Define space lattice.	UN	3
4	When pressure increases mean free path	UN	1
5	Explain the term roasting in metallurgy.	UN	4
6	What is the main difference between CNG and LNG?	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	Clarify the concept of isotropy and anisotropy in crystals.	UN	3
8	Explain Van Arkel method of purification of titanium.	UN	4
9	A metal crystallizes in a FCC structure with a known unit cell dimension, density and molar mass. How would you apply this information to estimate Avogadro's number?	AP	3
10	How would you convince a company to invest in nanostructured solar cells?	AP	2

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	A) Compare and contrast the structure of NaCl & KCl. OR B) Compare the advantages and limitations of single-crystal XRD and powder XRD for structure determination.	AN	3, 3
12	A)	AP	1, 1

Qn No.	Question	CL	CO
	(a) Explain the Joule–Thomson effect and the conditions under which a gas shows cooling or heating during expansion. (b) Analyze how the nature of intermolecular forces in a gas affects the Joule–Thomson coefficient. (c) Discuss why hydrogen and helium show heating instead of cooling during Joule–Thomson expansion at room temperature. OR B) Explain the concept of critical temperature, critical pressure, and critical volume in the context of the Law of Corresponding States.		
13	A) i) Evaluate any three methods of concentration of ores. ii) Explain the steps involved in the extraction of Aluminium. OR B) Compare and contrast top down and bottom-up approach to synthesize nanoparticles in detail.	EV	4, 4
14	A) Construct a public awareness campaign around green chemistry, targeting College students. Design promotional materials, events, and messaging that highlight the importance of eco-friendly chemical practices. OR B) Evaluate hydrogen gas as a future fuel replacing fossil fuels.	CR	2, 2