

Reg. No.:



Name:

University of Kerala

W7406

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE100 - INORGANIC CHEMISTRY I

Academic Level: 100-199

2025-Admission

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	Write the balanced redox reaction between KMnO_4 and oxalic acid in acid medium.	RE	4
2	Identify the dam whose construction was the main focus of the Narmada Bachao Andolan.	RE	3
3	Indicate the type of intermolecular interaction present in oxygen gas.	UN	2
4	Give reason for the insignificant wave nature of a fast-moving cricket ball.	UN	1
5	Comment any two harmful effects of fireworks.	UN	3
6	Give an example for metallochromic indicator.	UN	4

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	Compare the nature of matter waves and electromagnetic waves.	UN	1
8	Solvation energy influences the solubility of ionic solids in a solvent. Justify.	UN	2
9	Comment on the statement: COD is always greater than BOD for a particular water sample.	AP	3
10	Explain whether a measurement can be both accurate and precise, and state the meaning of a measurement that is both accurate and precise.	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	A)	AP	1, 1

Qn No.	Question	CL	CO
	Given $Z = 24$ (Cr), write the correct electronic configuration using Hund's rule and stability of half-filled orbitals. Explain why $3d^5 4s^1$ is favored over $3d^4 4s^2$. Classify the element into block, group, and period. OR B) Calculate the effective nuclear charge experienced by a 3d electron of a chromium atom and explain Slater's rule.		
12	A) Draw the molecular orbital diagram of O_2 molecule, analyze the bond order, magnetic behavior of O_2, O_2^+, O_2^-, O_2^{2-}. OR B) Explain the Born–Haber cycle for the formation of an ionic compound and analyze how it helps in determining lattice energy. Illustrate your answer with the example of CaF_2.	AN	2, 2
13	A) Assess critically different sources of water pollution and suggest any two treatment methods of industrial waste water OR B) Critically evaluate the formation and importance of the ozone layer, the human activities responsible for its depletion and the effectiveness of global measures taken to prevent its damage.	EV	3, 3
14	A) Design an experiment to determine the concentration of ferrous ion in iron tablets. OR B) Design a titration procedure to determine the concentration of an unknown hydrochloric acid solution using sodium carbonate as a primary standard. Include the chemical reactions, selection of an appropriate indicator, titration steps, and calculation of molarity. Discuss possible sources of error and how to minimize them.	CR	4, 4