



Reg. No.:

Name:

University of Kerala

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE104 - GENERAL INORGANIC CHEMISTRY

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	State Pauli's exclusion principle.	RE	1
2	Give an example for a low spin complex.	RE	2
3	The quantum numbers $n=5$ and $l=2$ corresponds to which orbital?	UN	1
4	Identify the oxidation number of Fe in $K_3[Fe(CN)_6]$.	UN	2
5	Light stable nuclei generally have an n/p ratio close to	UN	4
6	Define standard solution.	UN	3

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	State and explain Fajan's rule.	UN	1
8	Discuss the different units of radiations.	UN	4
9	A coordination complex with formula $CoCl_3 \cdot 4NH_3$ precipitates 1 mole of $AgCl$ per mole of the complex when treated with excess $AgNO_3$. By applying Werner's theory, write the coordination formula of this compound.	AP	2
10	Apply colorimetry to explain why a more concentrated solution absorbs more light and transmits less.	AP	3

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>Using Bohr's theory, explain the origin of the spectral lines in the hydrogen emission spectrum. Calculate the wavelength of the first line in the Balmer series.</p> <p>OR</p> <p>B)</p> <p>How do the four quantum numbers determine the arrangement of electrons in multi-electron atoms, and how can this be applied to justify the electron configuration of a sulfur atom</p>	AP	1, 1
12	<p>A)</p> <p>Examine valence bond theory of bonding in octahedral and tetrahedral complexes.</p> <p>OR</p> <p>B)</p> <p>Discuss crystal field theory of octahedral complexes.</p>	AN	2, 2
13	<p>A)</p> <p>Compare the principles and effectiveness of different detection methods for radioactivity, such as Geiger-Müller counters and Wilsons Cloud Chamber.</p> <p>OR</p> <p>B)</p> <p>Describe the major medical applications of radioactivity, explaining how radioisotopes are used in in medicine and agriculture.</p>	EV	4, 4
14	<p>A)</p> <p>Design a redox titration experiment using KMnO_4 to determine the concentration of an unknown oxalic acid solution. Specify the required chemicals, apparatus, balanced redox equations, and calculation steps.</p> <p>OR</p> <p>B)</p> <p>How would you design a step-by-step experimental procedure to standardize a sodium hydroxide solution using oxalic acid, including the choice of indicator and justification based on indicator theories?</p>	CR	3, 3