



Reg. No.:

W7992

Name:

University of Kerala
First Semester FYUGP Degree Examination, December 2025
Discipline Specific Core Course
CHEMISTRY
UK1DSCCHE104 GENERAL INORGANIC CHEMISTRY
Academic Level: 100-199
2024 Admission

Time: 1 Hour 30 Minutes

Max. Marks: 42

Part A.
6 Marks. Time: 6 Minutes
Objective Type. 1 Mark Each. Answer All Questions
(Cognitive Level: Remember/Understand)

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	The most common chelating agent used in complexometric titrations	Remember	CO-4
2.	Write the electronic configuration of Cerium	Remember	CO-1,2,3
3.	What term describes the process of converting one element into another via nuclear reactions?	Understand	CO-7
4.	Which is the suitable indicator used in the titration of acetic acid against sodium hydroxide?	Understand	CO-5,6
5.	Specify four quantum numbers of the electron in the 1s orbital of Hydrogen	Understand	CO-1,2,3
6.	What is the role of a moderator in a nuclear reactor?	Understand	CO-7

Part B.
8 Marks. Time: 24 Minutes
Short Answer. 2 Marks Each. Answer All Questions
(Cognitive Level: Understand/Apply)

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Why is EDTA titrations are called complexometric titration?	Understand	CO-4
8.	Express the equation giving the frequency of first line of Lyman series.	Understand	CO-1,2,3
9.	How does the neutron-to-proton ratio influence the stability of an atomic nucleus, and why is this ratio critical in determining whether a nucleus will undergo radioactive decay?	Apply	CO-7
10.	How do you prepare a 500 mL solution of 2 M sodium hydroxide (NaOH), given that the molar mass of NaOH is 40 g/mol. What is the weight of NaOH per litre of that solution?	Apply	CO-5,6

Part C.
28 Marks. Time: 60 Minutes
Long Answer. 7 marks each.
Answer all 4 Questions, choosing among options within each question.
(Cognitive Level: Understand/Apply/Analyze)

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Explain the nature of bonding, hybridization and magnetic properties of $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{Ni}(\text{CO})_4]$ on the basis of valence bond theory. OR b. Explain Werner's coordination theory with suitable examples.	Understand	CO-4
12.	a. Illustrate quantum numbers and interpret all the quantum numbers to $4s^2$ and $3d^5$ electronic configuration. OR b. Demonstrate the geometry of BeCl_2, BF_3 and CH_4 using the concept of hybridization.	Apply	CO-1,2,3
13.	a. i. Derive an equation for the decay constant of a radioactive material. ii. By taking the example of He atom discuss the concept of mass defect and binding energy. OR b. Discuss the applications of radioactivity in medicine and agriculture.	Apply	CO-7
14.	a. Design an experiment to estimate glucose concentration using colorimetry. OR b. Analyze the principle of redox titrations, specifically using a permanganometric titration as example.	Analyze	CO-5,6