

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026
(Regular/Improvement/Supplementary)

CHEMISTRY
GCHE6B09T: INORGANIC CHEMISTRY - IV

Time: 2 Hours

Maximum Marks: 60

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 marks)

1. State Jahn-Teller Theorem.
2. What is 18-electron rule? Explain with one example.
3. Mention any two applications of SEM.
4. Explain why Ce(III) can be easily oxidized to Ce(IV).
5. Why does separation of lanthanides is difficult?
6. Name any two Zinc containing metalloenzymes. Mention their biological role.
7. What are mononuclear carbonyls? Give any two examples.
8. An octahedral complex of Fe^{2+} is diamagnetic. Is it an inner orbital or outer orbital complex?
9. What is spectrochemical series?
10. Give the structure and significance of carboplatin.
11. What are Ziegler-Natta Catalysts? Give its synthetic importance.
12. Give the principle of Atomic Absorption spectroscopy.

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 marks)

13. Discuss the separation of lanthanides by ion-exchange method.
14. Explain the crystal field splitting in octahedral complexes.
15. Discuss the important factors that affect the magnitudes of crystal field splitting.
16. Write a short note on biochemistry of Co.
17. Give the principle and applications of TEM.
18. Illustrate the toxic effects produced by mercury and arsenic.
19. How is ferrocene prepared? Explain the bonding in ferrocene based on VBT.

SECTION C: Answer any *one* question. The question carries *ten* marks.

20. a) Discuss the principle and applications of XRD.
b) Compare the similarities and differences between lanthanides and actinides.
21. Discuss the applications of complexes in qualitative and quantitative analysis.

(1 × 10 = 10 Marks)