

23U612

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Name:

Reg.No:

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19UCHE6B09 - INORGANIC CHEMISTRY - IV

(Chemistry - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. Mention two applications of TEM.
2. What is meant by thermogravimetry?
3. The aryls of transition metals are slightly more stable and slightly less reactive than their alkyls. Why?
4. Give an example with structure for a bridged polynuclear carbonyl.
5. Mention the characteristic importance of Wilkinson's catalyst
6. Se ion is colourless while Cr^{2+} ion is coloured. Explain.
7. Name a metalloporphyrin. What is the metal present in it?
8. Name an Au containing anticancer drug.
9. Explain the bonding in $[\text{Ni}(\text{CO})_4]$ on the basis of VBT.
10. Draw the crystal field splitting diagram of d-orbitals in square planar field.
11. Calculate the CFSE for the high spin octahedral complexes of transition metal d^5 and d^6 systems.
12. Which reagent is commonly used for the gravimetric estimation of nickel? Draw its structure.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Discuss the basic principles of the colorimetric method of analysis.
14. Give two examples for metal carbonyls obeying the 18-electron rule, justifying your answer.
15. How does Valence Bond Theory attempt to explain the nature of bonding in metals?

16. What is monazite sand? Explain a method to separate the group of lanthanides from the other ingredients of the monazite sand.
17. Discuss the mechanism of photosynthesis.
18. Write the electronic configuration of nickel in complexes.
(a) $[\text{NiCl}_4]^{2-}$ (b) $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ (c) $[\text{Ni}(\text{CO})_4]^{2+}$
19. Write a note on spectrochemical series.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Discuss the free electron theory of metallic bonding and how it explains the metallic properties.
21. What are the salient features of MOT for bonding in complexes? Explain with suitable example.

(1 × 10 = 10 Marks)
