25U121 (Pages: 2) Name : .....

Reg. No : .....

FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025

(FYUGP)

(Regular/Supplementary/Improvement)

CC24UCHE1MN106 - COORDINATION CHEMISTRY

(Chemistry - Minor Course)

(2024 Admission onwards)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. What is an interhalogen compound? Give example. [Level:1] [CO1]
2. Discuss the two uses of neon (Ne). [Level:2] [CO1]
3. What is the general trend in solubility of halides across the p-block elements? [Level:1] [CO1]
4. What is the most common oxidation state of lanthanides? [Level:1] [CO2]
5. Give one example of a nonstochiometric compound. [Level:1] [CO2]
6. What is a macrocyclic ligand? [Level:1] [CO3]
7. What is the formula for calculating the spin-only magnetic moment? [Level:1] [CO4]
8. Explain the merits of VBT. [Level:2] [CO4]
9. Give an example of a mononuclear carbonyl of iron (Fe). [Level:1] [CO5]
10. What is Zeise's salt, and what is its chemical formula? [Level:2] [CO5]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. Discuss the structure of perchloric acid ($HOCl_4$) and its position as the strongest oxo acid of chlorine. What structural features contribute to its high acidity? [Level:2] [CO1]
12. Illustrate the molecular structures of diborane (B_2H_6), boric acid (H_3BO_3), borazine ($B_3N_3H_6$), and boron nitride (BN). [Level:2] [CO1]

13. Describe the photoelectric effect as observed in alkali metals. Why are alkali metals more susceptible to the photoelectric effect compared to alkaline earth metals? [Level:2] [CO1]

14. Explain any three characteristics of actinides. [Level:2] [CO2]

15. Discuss the crystal field splitting in tetragonal complexes. [Level:2] [CO4]

16. What is meant by hydrate isomerism? Explain with examples. [Level:1] [CO3]

17. Discuss the merits and demerits of CFT. [Level:2] [CO4]

18. Describe the structure and bonding in ferrocene using Valence Bond Theory (VBT). [Level:2] [CO5]

(Ceiling: 36 Marks)

Part C (Essay questions)

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

19. Discuss the crystal field splitting in octahedral complexes. [Level:2] [CO4]

20. Describe Werner's coordination theory and its application in explaining the bonding in coordintion compounds. [Level:2] [CO3]

(1 × 10 = 10 Marks)

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