22U612 (Pages: 2) Name : .....

Reg No. : .....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2025

(CBCSS-UG)

(Regular/Supplementary/Improvement)

CC19U CHE6 B09 - INORGANIC CHEMISTRY - IV

(Chemistry - Core Course)

(2019 Admission onwards)

Time: 2 Hours Maximum: 60 Marks

Credit: 3

Part A (Short answer questions)

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

1. Name two kinds of atomizers used in atomic absorption spectroscopy.
2. What is electron gun in SEM?
3. What is a DSC curve? What information does it carry?
4. What is Wilkinson's catalyst?
5. Give one example each for (i) a ferromagnetic transition metal ion and (ii) a paramagnetic transition metal ion.
6. Name two important minerals that occur in the beach sands of Kerala and state their approximate composition.
7. Give the structure of Vitamin B12.
8. What is the major drawback of cis-platin?
9. What are the important assumptions of the crystal field theory of complexes?
10. Give the number of unpaired electrons in strong and weak octahedral fields for Cr^{3+}.
11. Distinguish between the term labile and inert complexes.
12. Explain breifly how EDTA is useful in the determination of metal ions.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Explain the bonding in pi-metal alkenyl complexes.
14. Explain the classification of metal carbonyls with suitable example.

15. What is monazite sand? Explain a method to separate the group of lanthanides from the other ingredients of the monazite sand.

16. Draw the structure of porphine and explain how the structures of heme and chlorophyll are related to it.

17. Discuss the relationship between the coordination numbers of metal ions and the stereochemistry of complexes taking the examples of coordination numbers 4 and 6.

18. Describe the factors that affect the magnitude of crystal field splitting in complexes.

19. If the Fe^{2+} coordination complex is $[Fe(CN)_6]^{4-}$, state whether you expect the complex to be high spin or low spin? Justify your answer.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Discuss the synthesis, structure and bonding in ferrocene.

21. (a) Explain why transition metal compounds are coloured.
    (b) Explain the catalytic action of transition metals and their compounds.

(1 × 10 = 10 Marks)

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