21U611 (Pages: 2) Name: .....

Reg.No: .....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U CHE6 B09 - 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. Which are the main components of a spectrophotometer?
2. What is meant by thermogravimetry?
3. Comment on the structure of trimethylaluminium compounds.
4. How can ferrocene be converted to ferrocene carboxylic acid?
5. Why does Mn(II) show maximum paramagnetic character among the bivalent ions of first transition series?
6. What are lanthanides?
7. Explain cooperative effect.
8. Explain the significance of calcium concentrtion in the functioning of calmodulin.
9. What are the important assumptions of the crystal field theory of complexes?
10. How is CFT useful in explaining the colour of transition metal complexes?
11. Briefly discuss the the merits and demerits of MOT.
12. Briefly discuss the factors affecting stability of complexes.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Discuss the nature of interactions of the high energy electron beam with the selected specimen in scanning electron microscopy
14. Explain with details of bonding the mergic effect operative in metal carbonyls.
15. Explain why transition metals are hard and brittle while alkaline and alkaline earth metals are soft.

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 formation of the following complex ions on the basis of VBT (a) [Cr(NH3)6]3+ (b) [Fe(H2O)6]2+

18. What is meant by crystal field splitting energy? On the basis of crystal field theory, write the electronic configuration of d4 in terms of t2g and eg in an octahedral field when (a)Δ0>P (b) Δ0

19. Write a note on the CFSE for low spin and high spin octahedral complex.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Explain the synthetic applications of Ziegler-Numa catalysts and () Wilkinson's catalyst.

21. Give the structure and mechanism of action of three anticancer drugs.

(1 × 10 = 10 Marks)

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