D 100523 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. (CBCSS—UG) DEGREE EXAMINATION MARCH 2024

Chemistry/Polymer Chemistry

CHE 6B 09—INORGANIC CHEMISTRY—IV

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answers)

Answer questions up to 20 *marks.*

Each question carries 2 *marks.*

1. Give one example each for reference electrode, working electrode and counter electrode of cyclic voltammetry.
2. Give any *two* radiation source in AFM.
3. Explain why does colour of $KMnO_4$, disappear when oxalic acid is added to its solution in acidic medium.
4. Why $[Fe(CN)_6]^{3-}$ is weakly paramagnetic while $[Fe(CN)_6]^{4-}$ is diamagnetic ?
5. Arrange the following complexes in the increasing order of conductivity of their solution : $[Co(NH_3)_3Cl_3]$, $[Co(NH_3)_4Cl_2]$ Cl, $[Co(NH_3)_6]Cl_3$, $[Cr(NH_3)_5Cl]$ Cl_2.
6. Why are low spin tetrahedral complexes not formed ?
7. Calculate CFSE of low spin and high spin d^6 metal complexes of octahedral geometry in terms of Δo.
8. Classify the organometallic compounds based on the nature of metal ligand bond with one example each.
9. Arrange the following ligands in the increasing order of field strength H_2O, Cl^-, CO and NH_3.
10. Illustrate 18-electron rule taking ferrocene as example.
11. Draw the structure of $Fe_2(CO)_9$.
12. Explain any *two* biological role of Calcium in human body.

(Ceiling of marks: 20)

Turn over

Section B (Paragraph)

Answer questions up to 30 *marks.*
Each question carries 5 *marks.*

13. Draw the TGA of $CuSO_4$ $5H_2O$ and explain.

14. List out the different detectors used in AAS and its working principles.

15. Explain the metallic properties of transition metal based on the band theory.

16. Discuss the different factors affecting crystal field splitting.

17. Explain the hydrogenation of alkene by using Wilkinson catalyst.

18. Briefly explain the structure and bonding in Zeise's salt.

19. Illustrate inner orbital and outer orbital complexes.

(Ceiling of marks : 30)

Section C (Essay)

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

20. (a) Discuss the importance of beach sands in Kerala.

    (b) Explain the Jahn Teller distortion of octahedral complex.

21. Explain the following :

    (a) Sodium potassium pump.

    (b) Structure and significance of carboplatin and auranofin.

(1 × 10 = 10 marks)