**D 140103** **(Pages : 2)** **Name.....**

**Reg. No.....**

**SIXTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION**
**APRIL 2026**

Chemistry/Polymer Chemistry

CHE 6B 09—INORGANIC CHEMISTRY—IV

(2020 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 the principle of Flame emission spectroscopy.
2. Draw the TGA of $CaC_2O_4.H_2O$.
3. Illustrate non-stoichiometric compounds.
4. Why $NF_3$ is a weaker ligand than $N(CH_3)_3$ ?
5. Arrange the following complex ions in increasing order of crystal field splitting energy $(\Delta_0): \left[Cr(Cl)_6\right]^{3-}, \left[Cr(CN)_6\right]^{3-}, \left[Cr(NH_3)_6\right]^{3+}$.
6. Why do compounds having similar geometry have different magnetic moments ?
7. Arrange the following ligands in the increasing order of field strength $H_2O, Cl^-$, CO and $NH_3$.
8. $CuSO_4.5H_2O$ is blue in colour while $CuSO_4$ is colourless. Why ?
9. Explain why $\left[Fe(HO)_6\right]^{3+}$ has a magnetic moment value of 5.92 BM whereas $\left[Fe(CN)_6\right]^{3-}$ has a value of only 1.74 BM.
10. Explain 18-electron rule with the help of an example.

**Turn over**

11. Classify the organometallic compounds based on the nature of metal ligand bond with one example each.

12. List out any *four* industrial importance of lanthanides or their compounds.

(Ceiling of marks : 20)

**Section B (Paragraph)**

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

13. Explain the basic principle of AAS.

14. Distinguish between the techniques SEM and TEM.

15. Compare the properties of 3d, 4d and 5d series with special reference to magnetic, catalytic, reducing and complex formation properties.

16. Discuss the applications of complexes in qualitative and quantitative analysis with suitable examples.

17. Differentiate the structure and bonding in mono nuclear and polynuclear metal carbonyls of iron.

18. What is Zeigler Natta catalyst ? Explain the different steps of polymerization using this catalyst.

19. How to enter lead into the human body and explain the adverse effects ?

(Ceiling of marks: 30)

**Section C (Essay)**

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

20. (a) Compare the electronic configuration and general characteristics of lanthanides and actinides.

    (b) Explain the crystal field splitting of octahedral and square planar geometry.

21. Explain the structure of haemoglobin and their oxygen binding mechanism.

(1 × 10 = 10 marks)